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ROD Annual Report, FY 1989

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April 1990

ROD ANNUAL REPORT
FY 1989

Office of Emergency and Remedial Response
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FY 1989 ROD ANNUAL REPORT
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SECTION I

INTRODUCTION

INTRODUCTION

FY 1989 marks the third year since the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), which amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). During this period, the remedial program has modified its approach in site cleanups to reflect mandates in CERCLA, as amended by SARA; for example, Section 121 of CERCLA mandates the selection of a remedial action that is protective of human health and the environment, complies with applicable or relevant and appropriate Federal and State requirements (ARARs), is cost-effective, and utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element, and requires an explanation in those cases in which the selected remedy does not satisfy this preference. The Records of Decision (RODs) listed in this report document compliance with these mandates in the remedial program in FY 1989. All of the FY 1989 RODs were approved at the Regional level, which is consistent with the policy initiated in FY 1986 to delegate ROD approval authority to the Regions.

FY 1989 RODs

One hundred thirty-nine (139) RODs and four (4) ROD Amendments, including Fund-lead, Enforcement-lead, and Federal Facility RODs were signed during FY 1989. The data in the ROD Annual Report are based on these 143 RODs and ROD Amendments; for clarity, however, these are collectively referred to as RODs throughout the remainder of the report. Ninety-five (95) of the FY 1989 RODs addressed final source control. The remaining 48 RODs selected interim source control actions (10), ground water remedies only (26), or no action/no further action (12). Forty-eight (48) RODs selected both source control and ground water remediation components.

In keeping with CERCLA Section 121 and the National Contingency Plan's (NCP) program expectations, source treatment was selected in 69 of the 95 final source control RODs. In addition, 24 of the 29 final and interim source control RODs that selected containment only were large landfills, mining waste/smelter sites, or asbestos sites. This is consistent with the NCP expectation that treatment will often be impractical for these types of sites. Also in keeping with NCP program expectations, ground water should be returned to its beneficial uses within a reasonable time frame, when practicable. This expectation has been evidenced by the selection of active ground water treatment in addition to a source control remedy in 47 RODs, and in 20 RODs where source control was not being addressed.

Exhibits 1 through 7 summarize the results of the 143 FY 1989 selected remedies. These remedies are presented in abstract form in this report. Exhibit 1 provides a quantitative summary of remedial action components by final and interim actions. This exhibit demonstrates that occurrences of the use of treatment technologies (100) in selected remedies exceeded that of containment only (31) by a factor of more than three, and ground water treatment occurs in nearly half of the selected remedies (67 pump-and-treat remedies out of 143 RODs). Exhibit 2 illustrates the frequency with which treatment technologies were selected in final and interim source control RODs. These data reflect the 100 occurrences of treatment technologies employed in the 76 final and interim source control RODs. Therefore, more than one treatment technology may be associated with a ROD. Incineration/thermal treatment was selected most frequently (30 RODs), followed by solidification/stabilization (18 RODs), and vacuum extraction (17 RODs). Solvent extraction was selected in 6 RODs, which represents a significant improvement in the use of this treatment technology in the remedial program compared to previous fiscal years. Exhibit 3 portrays the source control remedial action components presented in Exhibit 1 as either final or interim remedies. Exhibit 4 illustrates the number of final and interim source control remedies employed in each treatment category. Of the 100 treatment technologies selected, 81 were selected in final source control RODs, while 19 were selected in interim source control RODs.

An index of site remedies for FY 1989 is provided in Exhibit 5. This index contains RODs grouped by the specific type of source control and/or non-source control remedies selected. To accurately assess the technology data presented in Exhibits 1 through 5, a description of each treatment category is provided in Exhibit 6. Also included, in Exhibit 7, is a summary of FY 1989 ROD data on estimated remedial action costs.

Historical Overview FY 1982-1989

The passage of SARA strengthened and extended the Superfund program while maintaining the overall framework for implementation. New requirements under CERCLA, as amended by SARA, were intended to ensure protective cleanup standards, permanent remedies, and the use of alternative technologies, where applicable. An historical overview of FY 1982-1989 RODs is provided in Exhibits 8 through 12 to show annual progress in achieving statutory mandates. This overview includes data collected for Exhibits 1 through 7 (e.g., the number of RODs signed per year, the use of treatment technologies for source control, and the estimated remedial action costs). Exhibit 8 depicts the number of RODs signed per fiscal year. This demonstrates that there has been a marked increase in the number of RODs signed since the enactment of SARA compared to the pre-SARA years of the remedial program. Exhibit 9 is a quantitative overview of the occurrences in which treatment technologies have been selected in final and interim source control RODs. An index of the ROD sites where these treatment technologies were selected is provided in Exhibit 10 for reference.

Comparative data on the selection of treatment technologies in final and interim source control remedies for post-SARA RODS (FY 1987-1989) are presented in Exhibit 11. These data demonstrate that, in accordance with SARA, there has been an increase in the percentage of RODs selecting treatment as a principal element of source control and an increase in the percentage of the treatment technologies selected that were innovative (e.g., treatment technologies other than incineration/thermal treatment and solidification/stabilization). A comparison of FY 1982-1989 ROD data on remedial action costs is summarized in Exhibit 12.

During FY 1990, EPA plans a comprehensive review of historical ROD data based on current definitions of treatment technologies, and interim and final remedial action categories.

FY 1989 ROD Annual Report

The FY 1989 ROD Annual Report is designed to provide the Regions, Headquarters, and the public with summary information on FY 1989 RODs and historical information on FY 1982-1989 RODs. The report should be used as a reference document. To ensure ease of reference, the material in this report is divided into the following sections:

- Introduction - highlights accomplishments in the remedial program, and compliance with CERCLA and the NCP
- FY 1989 ROD Abstracts - describes site conditions, key contaminants, selected remedial actions, specific performance standards and goals, institutional controls, remedial action costs, operation and maintenance costs, and site-specific keywords for each FY 1989 ROD
- FY 1989 ROD Summary Table - provides the remedial action number (e.g., 1st, 2nd, etc.), and summarizes the contaminants by media, estimated waste volume, major components of the selected remedy, cleanup goals for key contaminants, present worth or capital costs, and operation and maintenance costs for each FY 1989 ROD
- FY 1982-1988 ROD Summary Table - provides the remedial action location and date, and summarizes the contaminants by media, estimated waste volume, major components of the selected remedy, cleanup goals for key contaminants,

present worth or capital costs, and operation and maintenance costs for each FY 1982-1988 ROD

- ROD Keyword List - provides a summary listing under each keyword of all RODs that have an association with the keyword based on the selected remedial action. A keyword list index located at the beginning of the section provides an overview of all keyword categories within the list.

Exhibit 1

FY 1989 ROD TECHNOLOGY SUMMARY[a]

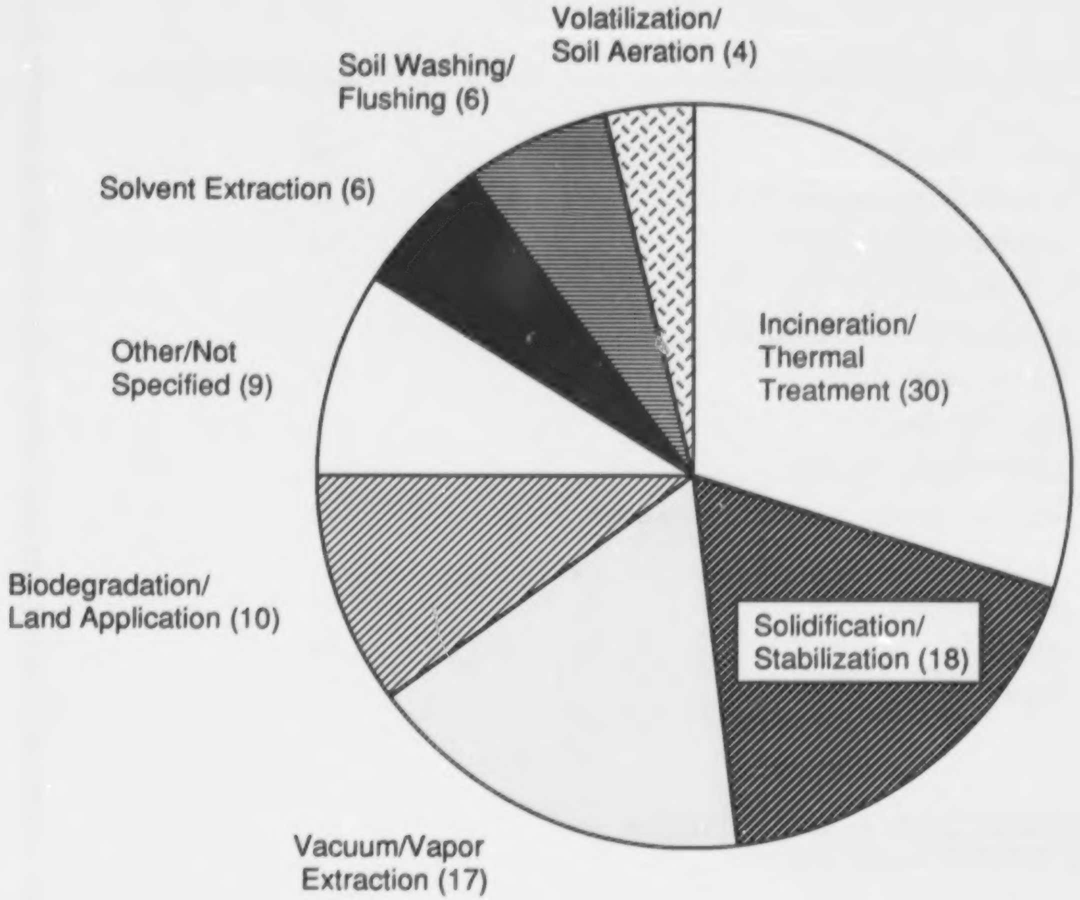
SOURCE CONTROL REMEDIATION	TOTAL NUMBER OF OCCURRENCES
Treatment Technology[b,c]	**100**
Incineration/Thermal Treatment	30
Solidification/Stabilization	18
Vacuum/Vapor Extraction	17
Biodegradation/Land Application	10
Soil Washing/Flushing	6
Solvent Extraction	6
Volatilization/Soil Aeration	4
Other/Not Specified Treatment Technologies	9
Containment Only	31
Onsite	24
Offsite	7
NON-SOURCE CONTROL REMEDIATION TECHNOLOGY SELECTIONS	
Pump and Treat	67
Alternate Water Supply	8
Other (e.g., Natural Attenuation)	2
Leachate Treatment	7

---

[a] Includes final and interim action RODs; more than one remedy may be associated with a ROD.
[b] Categorized by principal treatment technology; treatments used as subsequent components of a treatment train are not included.
[c] Data reflect occurrences of technologies as selected in the 76 source control RODs that used treatment as the principal remedy; more than one technology may be associated with a ROD.

Exhibit 2

OCCURRENCES OF TREATMENT TECHNOLOGIES IN FY 1989 SOURCE CONTROL REMEDIES[a,b]



OCCURRENCES IN RODs	PERCENT	TYPES
30	30%	Incineration/Thermal Treatment
18	18%	Solidification/Stabilization
17	17%	Vacuum/Vapor Extraction
10	10%	Biodegradation/Land Application
6	6%	Soil Washing/Flushing
6	6%	Solvent Extraction
4	4%	Volatilization/Soil Aeration
9	9%	Other/Not Specified Treatment Technologies
100[a]	100%	

---

[a] Includes final and interim action RODs.

[b] Data reflect occurrences of technologies as selected in the 76 source control RODs that used treatment as the principal remedy; more than one technology may be associated with a ROD.

Exhibit 3

FY 1989 SOURCE CONTROL REMEDIES CATEGORIZED BY FINAL AND INTERIM ACTIONS[a]

TYPE OF SOURCE CONTROL	Occurrences in Final Source Control RODs	Occurrences in Interim Source Control RODs	Total Occurrences
Treatment Technologies	**81**	**19**	**100**
Incineration/Thermal Treatment	24[b]	6	30
Solidification/Stabilization	15	3	18
Vacuum/Vapor Extraction	14	3	17
Volatilization/Soil Aeration	4	0	4
Soil Washing/Flushing	6	0	6
Biodegradation/Land Application	8	2	10
Solvent Extraction	5	1	6
Other/Not Specified Treatment Technologies	5	4	9
Containment Only	**26**	**5**	**31**
Onsite	21	3	24
Offsite	5	2	7

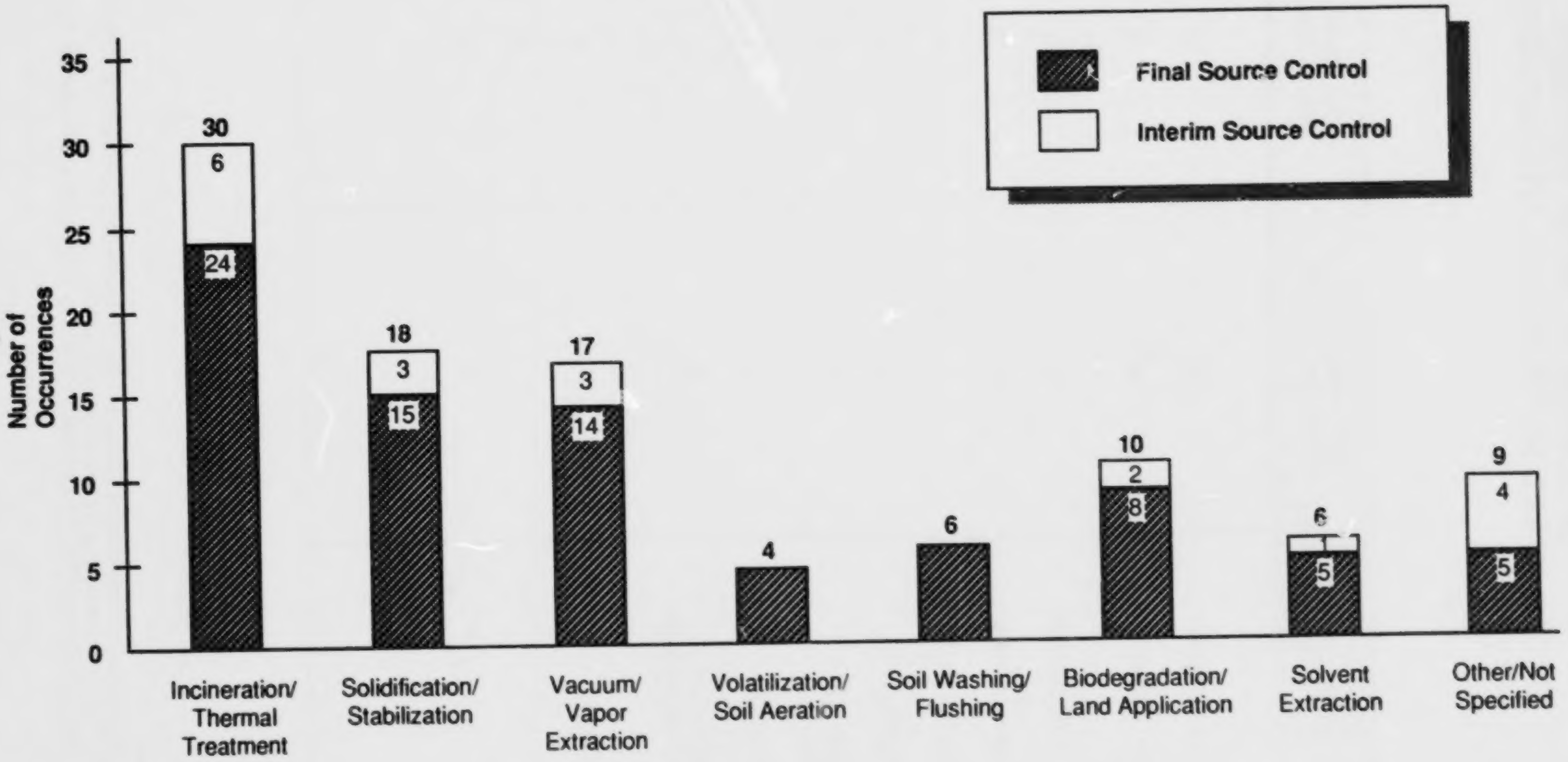
---

[a] Data reflect occurrences of technologies selected in the 76 source control RODs that selected treatment as the principal remedy; more than one remedy may be associated with a ROD.

[b] Includes two RODs that selected in-situ vitrification (Ionia City Landfill, MI and Northwest Transformer, WA).

Exhibit 4

OCCURRENCES OF TREATMENT TECHNOLOGIES IN FINAL AND INTERIM SOURCE CONTROL REMEDIES[a]



Treatment Technology

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[a] Data reflect occurrences of technologies as selected in the 76 source control RODs that used treatment as the principal remedy; more than one remedy may be associated with a ROD.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989

SOURCE CONTROL[a]

TREATMENT TECHNOLOGIES	REGION	SITE NAME, STATE
Incineration/Thermal Treatment (30)	I	Baird & McGuire, MA
	I	Pinette's Salvage Yard, ME[c]
	I	Wells G&H, MA[c]
	I	* W.R. Grace (Acton Plant), MA[c]
	II	Bog Creek Farm, NJ
	II	De Rewal Chemical, NJ[c]
	II	* FAA Technical Center, NJ[c]
	II	Fulton Terminals, NY
	III	Douglassville Disposal, PA
	III	M.W. Manufacturing, PA
	III	Whitmoyer Laboratories, PA[b]
	IV	Aberdeen Pesticides/Fairway Six, NC
	IV	American Creosote Works, TN[c]
	IV	* Celanese (Shelby Fiber Operations), NC[c]
	IV	Newsom Brothers/Old Reichhold, MS
	IV	Smith's Farm, KY[c]
	V	* Alsco Anaconda, OH[c]
	V	* Big D Campground, OH
	V	* Cliffs/Dow Dump, MI[c]
	V	Cross Brothers Pail (Pembroke), IL[c]
	V	* Ionia City Landfill, MI
	V	Laskin/Poplar Oil, OH
	V	* New Brighton/Arden Hills (TCAAP), MN
	V	Ninth Avenue Dump, IN
	V	Outboard Marine (Amendment), IL[b]
	V	Wedzeb Enterprises, IN
	VII	* Vogel Paint & Wax, IA[b,d]
	VIII	* Sand Creek Industrial, CO[c]
	VIII	* Woodbury Chemical, CO
	X	* Northwest Transformer, WA
Solidification/Stabilization (18)	I	Sullivan's Ledge, MA
	I	* W.R. Grace (Acton Plant), MA[c]
	II	De Rewal Chemical, NJ[c]
	II	Marathon Battery, NY
	III	* Craig Farm Drum, PA
	III	Hebelka Auto Salvage Yard, PA
	III	* Ordnance Works Disposal Areas (Amendment), WV[c]
	IV	Amnicola Dump, TN

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989
(Continued)

Solidification/Stabilization (18) (Continued)	IV	* Celanese (Shelby Fiber Operations), NC[c]
	IV	Kassouf-Kimerling, FL
	IV	Smith's Farm, KY[c]
	V	* Auto Ion Chemicals, MI
	V	* MIDCO I, IN[c]
	V	* MIDCO II, IN
	VI	Pesses Chemical, TX
	IX	* Coast Wood Preserving, CA
	IX	* Koppers (Oroville Plant), CA[c]
	IX	Purity Oil Sales, CA
Vacuum/Vapor Extraction (17)	I	Kellogg-Deering Well Field, CT
	I	* South Municipal Water Supply Well, NH
	I	Wells G&H, MA[c]
	II	* FAA Technical Center, NJ[c]
	V	Kysor Industrial, MI
	V	Miami County Incinerator, OH
	V	* MIDCO I, IN[c]
	V	Wausau Water Supply (9/29/89), WI
	VII	Hastings Ground Water, NE
	VIII	* Sand Creek Industrial, CO[c]
	IX	* Fairchild Semiconductor (Mt. View), CA[c] (1st Remedial Action)
	IX	* Fairchild Semiconductor (Mt. View), CA[c] (2nd Remedial Action)
	IX	* Fairchild Semiconductor (S San Jose), CA
	IX	* IBM (San Jose Plant), CA
	IX	* Intel (Mt. View Plant), CA[c]
	IX	* Litchfield Airport Area, AZ
	IX	* Raytheon (Mt. View Plant), CA[c]
Biodegradation/Land Application (10)	III	* Ordnance Works Disposal Areas (Amendment), WV[c]
	III	Whitmoyer Laboratories, PA[b]
	IV	American Creosote Works, FL
	V	* Cliffs/Dow Dump, MI[c]
	V	Galesburg/Koppers, IL
	VI	* Sheridan Disposal Services (12/29/88), TX
	VII	* Vogel Paint & Wax, IA[b,d]
	VIII	* Burlington Northern (Somers Plant), MT
	VIII	* Libby Ground Water, MT
	IX	* Koppers (Oroville Plant), CA[c]
Soil Washing/Flushing (6)	II	Byron Barrel & Drum, NY
	II	Vineland Chemical, NJ[c] (Soil Washing)
	II	Vineland Chemical, NJ[c] (Soil Flushing)
	IV	Cape Fear Wood Preserving, NC
	V	Cross Brothers Pail (Pembroke), IL[c]
	IX	* Koppers (Oroville Plant), CA[c]

---

* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989
(Continued)

Solvent Extraction (6)	I	Norwood PCBs, MA
	I	* O'Connor, ME
	I	Pinette's Salvage Yard, ME[c]
	II	Ewan Property, NJ[c]
	V	Outboard Marine (Amendment), IL[b]
	VI	United Creosoting, TX
Volatilization/Soil Aeration (4)	IX	* Fairchild Semiconductor (Mt. View), CA[c] (1st Remedial Action)
	IX	* Fairchild Semiconductor (Mt. View), CA[c] (2nd Remedial Action)
	IX	* Intel (Mt. View Plant), CA[c]
	IX	* Raytheon (Mt. View Plant), CA[c]
Other/Not Specified Treatment Technologies (9)	I	Saco Tannery Waste Pits, ME
	II	Claremont Polychemical, NY
	II	SMS Instruments (Deer Park), NY
	III	Havertown PCP, PA
	III	Publicker/Cuyahoga Wrecking, PA
	IV	American Creosote Works, TN[c]
	V	* Alsco Anaconda, OH[c]
	VII	* Doepke Disposal (Holliday), KS
	VII	Findett, MO
CONTAINMENT ONLY		
Onsite (24)	I	Auburn Road Landfill, NH
	II	Chemical Insecticide, NJ
	II	Clothier Disposal, NY
	II	* North Sea Municipal Landfill, NY
	II	Pepe Field, NJ
	II	Port Washington Landfill, NY
	III	Ambler Asbestos Piles, PA
	III	* Henderson Road, PA
	III	Wildcat Landfill, DE
	IV	* Chemtronics (Amendment), NC
	V	* Bowers Landfill, OH[d]
	V	E.H. Schilling Landfill, OH
	V	Industrial Excess Landfill, OH
	V	* Wauconda Sand and Gravel, IL
	V	Windom Dump, MN
	VI	* Motco, TX
	VII	Cherokee County, KS
	VII	Todtz, Lawrence Farm, IA
	IX	Atlas Asbestos Mine, CA
	IX	Coalinga Asbestos Mine, CA
	IX	* Nineteenth Avenue Landfill, AZ
	IX	South Bay Asbestos Area, CA
	X	* Comm Bay Near Shore/Tide Flats, WA[d]
	X	* Northside Landfill, WA[d]

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989 (Continued)

Offsite (7)	II	Glen Ridge Radium, NJ
	II	Montclair/West Orange Radium, NJ
	V	* Bowers Landfill, OH[d]
	VII	Kem-Pest Laboratories, MO
	VIII	* Monticello Vicinity Properties, UT
	IX	* Beckman Instruments, CA
	X	* Comm Bay Near Shore/Tide Flats, WA[d]

NON-SOURCE CONTROL

Pump and Treatment (20)	II	Caldwell Trucking, NJ
	II	Ciba-Geigy, NJ
	II	Picatinny Arsenal, NJ
	II	Preferred Plating, NY
	III	Bally Ground Water, PA
	III	* Kimberton, PA
	IV	* Carolawn, SC
	IV	* Stauffer Chemical (Cold Creek Plant), AL
	IV	* Stauffer Chemical (LeMoyne Plant), AL
	IV	* Sydney Mine Sludge Ponds, FL
	V	Hedblum Industries, MI
	V	Northernaire Plating, MI
	V	Ott/Story/Cordova Chemical, MI
	V	Waite Park Wells, MN
	V	Wausau Water Supply (12/23/88), WI
	VII	* Chemplex, IA
	VII	* Solid State Circuits, MO
	IX	* Firestone Tire (Salinas Plant), CA
	IX	Sacramento Army Depot, CA
	IX	San Fernando Valley (Area 1), CA
Pump and Treatment in Addition to a Source Control Remedy (47)	I	Auburn Road Landfill, NH
	I	Kellogg-Deering Well Field, CT
	I	Norwood PCBs, MA
	I	* O'Connor, ME[c]
	I	Pinette's Salvage Yard, ME[c]
	I	* South Municipal Water Supply, NH
	I	Sullivan's Ledge, MA
	I	Wells G&H, MA[c]
	II	Bog Creek Farm, NJ
	II	Byron Barrel & Drum, NY
	II	Ewan Property, NJ
	II	* FAA Technical Center, NJ
	II	Fulton Terminals, NY
	II	Port Washington Landfill, NY
	II	SMS Instruments (Deer Park), NY
	II	Vineland Chemical, NJ
	III	* Craig Farm Drum, PA
	III	Douglassville Disposal, PA
	IV	Cape Fear Wood Preserving, NC

---

* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989 (Continued)

Pump and Treatment in Addition to a Source Control Remedy (47) (Continued)	V	Big D Campground, OH
	V	Cross Brothers Pail (Pembroke), IL[c]
	V	Galesburg/Koppers, IL
	V	Industrial Excess Landfill, OH
	V	Kysor Industrial, MI
	V	Miami County Incinerator, OH[d]
	V	* MIDCO I, IN[c]
	V	* MIDCO II, IN
	V	Ninth Avenue Dump, IN
	V	Wausau Water Supply (9/29/89), WI
	VI	* Motco, TX
	VII	Findett, MO
	VII	* Vogel Paint & Wax, IA[b,d]
	VIII	* Burlington Northern (Somers Plant), MT
	VIII	* Libby Ground Water, MT[d]
	IX	* Beckman Instruments, CA
	IX	* Coast Wood Preserving, CA
	IX	* Fairchild Semiconductor (Mt. View), CA[c] (1st Remedial Action)
	IX	* Fairchild Semiconductor (Mt. View), CA[c] (2nd Remedial Action)
	IX	* Fairchild Semiconductor (S San Jose), CA
	IX	* IBM (San Jose Plant), CA
	IX	* Intel (Mt. View Plant), CA[c]
	IX	* Koppers (Oroville Plant), CA
	IX	* Litchfield Airport Area, AZ
	IX	Purity Oil Sales, CA[d]
	IX	* Raytheon (Mt. View Plant), CA[c]
	X	* Northside Landfill, WA
Alternate Water Supply (4)	III	Croydon TCE, PA
	III	* CryoChem, PA
	III	Strasburg Landfill, PA[d]
	V	Byron Salvage Yard, IL
Alternate Water Supply in Addition to a Source Control and/or Pump and Treatment Remedy (4)	II	De Rewal, NJ[c]
	V	* Miami County Incinerator, OH[d]
	IX	Purity Oil Sales, CA[d]
	X	* Northside Landfill, WA[d]
Other Ground Water Remedies (Natural Attenuation) (2)	III	* New Castle Spill, DE
	VI	* Sheridan Disposal Services (09/27/89), TX

OTHER NON-SOURCE CONTROL REMEDIES

Leachate Treatment (1)	III	Strasburg Landfill, PA[d]

---

* Enforcement-lead RODs.
[a] RODs may contain non-source control remediation measures.
[b] ROD allows for implementation of one of two source control treatment technologies.
[c] ROD selected two or more source control treatment technologies.
[d] ROD selected two non-source control measures.

Exhibit 5

INDEX OF SITE REMEDIES FOR FY 1989
(Continued)

Leachate Treatment in Addition to Source Control Remedy (6)	II	Pepe Field, NJ
	III	* Henderson Road, PA
	IV	American Creosote Works, FL
	IV	Smith's Farm, KY[c]
	V	E.H. Schilling Landfill, OH
	VII	* Vogel Paint & Wax, IA[b,d]
NO FURTHER ACTION (12)		
	II	BEC Trucking, NY
	II	Vineland State School, NJ
	III	Reeser's Landfill, PA
	IV	* Ciba-Geigy (McIntosh Plant), AL
	V	Adrian Municipal Well Field, MN
	V	Cemetary Dump, MI
	V	New Brighton/Arden Hills (Amendment), MN
	V	Whitehall Municipal Wells, MI
	VI	* Homestake Mining, NM
	VI	South Valley/Edmunds Street, NM
	VII	Arkansas City Dump, KS
	VII	* John's Sludge Pond, KS

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 6

DESCRIPTION OF TREATMENT TECHNOLOGY CATEGORIES

TECHNOLOGY CATEGORY	TREATMENT TECHNOLOGY DESCRIPTION
INCINERATION/ THERMAL TREATMENT	Thermal destruction treatments use high temperature processes to destroy or detoxify hazardous waste, encompassing such technologies as incineration, pyrolysis, and wet oxidation. Incineration is a combustion process, producing CO_2, H_2O vapor, SO_2, NO_x, HCl gases, and ash. Specific incineration types include rotary kiln, liquid injection, fluidized-bed, and infrared treatment. Pyrolysis decomposes organics in an oxygen deficient atmosphere. Wet oxidation employs high pressure and temperature in a water solution or suspension to destroy organics. Vitrification is another high temperature treatment which destroys organic compounds and immobilizes inorganics in a glass melt.
SOLIDIFICATION/ STABILIZATION	Solidification/stabilization facilitates a chemical or physical reduction of the mobility of hazardous constituents. The solidification/stabilization procedures may occur in situ, in tanks, or in containers and will improve the physical characteristics of the material, decrease the surface area across which transfer of contaminants can occur, limit the solubilities, or reduce toxicity of the contaminants. Solidification generally produces a durable monolithic block of waste. Stabilization usually involves the addition and mixing of materials that limit the solubility or mobility of the waste constituents even though the physical characteristics of the waste may not be changed. Types of solidification/ stabilization treatment can be categorized further by the primary stabilizing agent used: cement-based, pozzolanic- or silicate-based, thermoplastic-based, or organic polymer-based.
VACUUM/VAPOR EXTRACTION	In-situ vacuum/vapor extraction is used to remove volatile organic compounds from soil. The system operates by applying a vacuum through production wells, forcing VOCs in the soil to diffuse into the production wells. As the VOC-contaminated air is withdrawn for treatment, fresh air is simultaneously drawn down from the soil surface into the soil. A similar system involves a series of air injection and air extraction wells. Fresh air is forced into the injection wells and VOC-contaminated air is withdrawn through the extraction wells.
VOLATILIZATION/ SOIL AERATION	In volatilization/soil aeration, soil is excavated and aerated in a mill or drum, causing VOCs to volatilize. The air containing VOCs is subsequently collected and treated.
SOIL WASHING/ FLUSHING	Soil washing extracts contaminants from excavated soil and sludge using a liquid medium, such as water, organic solvents, water/chelating agents, water/surfactants, acids, or bases. Soil flushing is applied in situ using an injection/recirculation system. In both systems, the washing solution is treated for removal of the contaminants via a conventional wastewater treatment system.

Exhibit 6

DESCRIPTION OF TREATMENT TECHNOLOGY CATEGORIES (Continued)

TECHNOLOGY CATEGORY	TREATMENT TECHNOLOGY DESCRIPTION
BIODEGRADATION/ LAND APPLICATION	Biodegradation uses micro-organisms to detoxify organic matter. There are several types of biodegradation applications, including composting, in-situ, solid phase, and slurry phase, which may occur in an aerobic or anaerobic atmosphere. Treatment may be accelerated by adjusting temperature, or supplying nutrients and/or oxygen.
SOLVENT EXTRACTION	Chemical extraction processes are used to separate contaminated soil and sludge into their respective phase fractions: organics, water and particulate solids. Types of solvent extraction include B.E.S.T., which uses a secondary or tertiary amine as the solvent, and critical fluid, which uses liquified gases (i.e., carbon dioxide and propane) at high pressure.

Exhibit 7

FY 1989 ROD REMEDY COST [a]

0 - $2M	44
2.1 - $5M	23
5.1 - $10M	23
10.1 - $20M	20
20.1 - $30M	7
$30.1M+	19
TOTAL RODs SIGNED	143[b]

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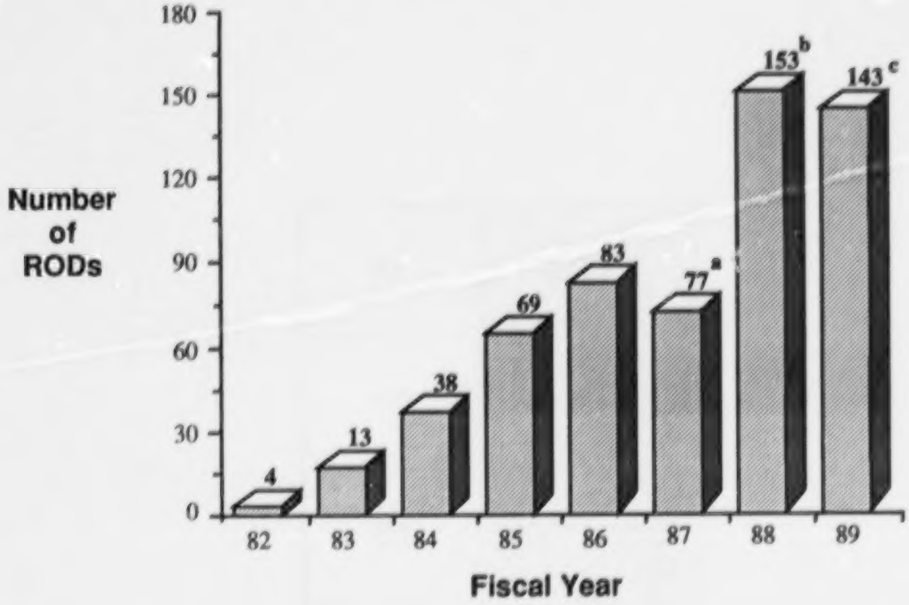
[a] Estimates are based on present worth costs when available.
[b] Data are not available for seven RODs.

Exhibit 8

RODS SIGNED PER FISCAL YEAR



RODS SIGNED PER FISCAL YEAR PER REGION

FY	Region I	Region II	Region III	Region IV	Region V	Region VI	Region VII	Region VIII	Region IX	Region X	TOTAL
1982	1	1	1	1	0	0	0	0	0	0	4
1983	3	2	2	0	2	0	1	0	2	1	13
1984	3	7	5	0	9	4	2	1	5	2	38
1985	7	13	10	5	20	5	1	2	3	3	69
1986	6	15	15	13	16	6	2	7	0	3	83
1987	5	15	5	11	14	11	3	7	5	1	77[a]
1988	11	22	26	12	25	21	12	4	13	7	153[b]
1989	11	23	18	15	32	7	11	5	18	3	143[c]

Total 580

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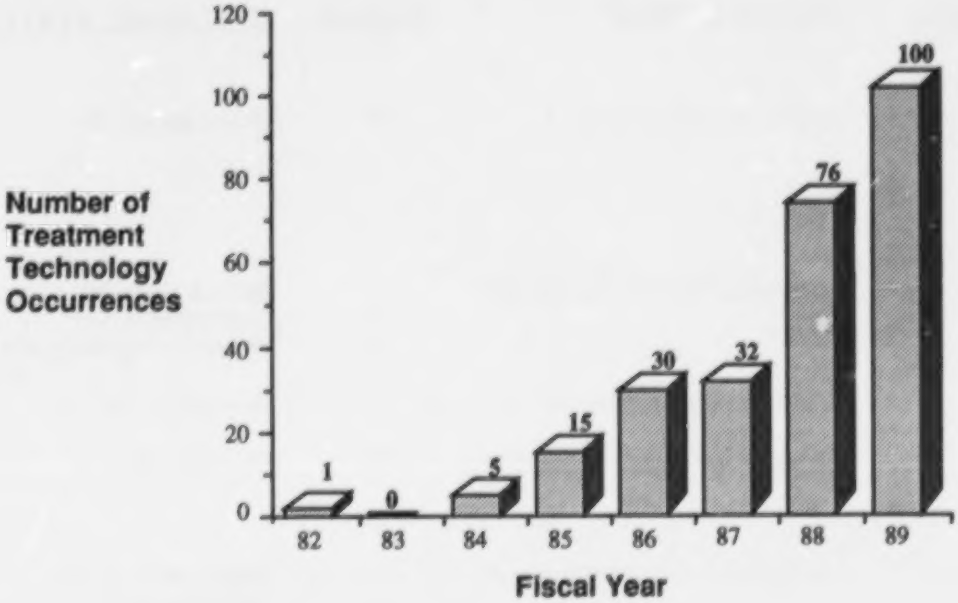
[a] Contains one ROD Amendment: Picillo Farm, RI 03/03/87 amends the 09/30/85 ROD.

[b] Contains one ROD Amendment: Tyson's Dump, PA 03/31/88 amends the 12/21/84 ROD.

[c] Contains four ROD Amendments: Ordnance Works, WV 09/29/89 amends the 03/31/88 ROD; Chemtronics, NC 04/26/89 amends the 04/05/88 ROD; Outboard Marine, IL 03/31/89 amends the 05/15/84 ROD; and New Brighton/Arden Hills (Well #7), MN 08/11/89 amends the 06/30/86 ROD.

Exhibit 9

OCCURRENCES OF SOURCE CONTROL TREATMENT TECHNOLOGIES PER FISCAL YEAR[a]



FY	Incineration/ Thermal Destruction	Solidification/ Stabilization	Vacuum/Vapor Extraction*	Volatilization/ Soil Aeration*	Soil Washing/ Flushing*	Biodegradation/ Land Application*	Solvent Extraction*	Other	TOTAL
1982	0	1	0	0	0	0	0	0	1
1983	0	0	0	0	0	0	0	0	0
1984	3	1	0	0	0	1	0	0	5
1985	7	2	1	2	2	1	0	0	15
1986	12	9	0	4	2	3	0	0	30
1987	13	9	1	2	2	1	0	4	32
1988	26	18	10	6	6	6	0	4	76
1989	30	18	17	4	6	10	6	9	100

Total 259

---

* Technologies titles in bold denote innovative technologies.

[a] Data reflect occurrences of technologies as selected in the 76 source control RODs that selected treatment as the principal remedy; more than one remedy may be associated with a ROD.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODS

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY82	Solidification/Stabilization (1)	III	Bruin Lagoon, PA
FY83	------		------
FY84	Incineration/Thermal Treatment (3)	V	Berlin & Farro, MI
		V	Laskin/Poplar, OH
		X	[*] Western Processing, WA
	Solidification/Stabilization (1)	VI	Bioecology, TX
	Biodegradation/Land Application (1)	VI	Old Inger, LA
FY85	Incineration/Thermal Treatment (7)	II	Bog Creek Farm, NJ
		II	Bridgeport, NJ
		II	Swope Oil, NJ
		V	Acme Solvents, IL
		VI	Motco, TX
		VI	Triangle Chemical, TX
		VIII	Woodbury Chemical, CO
	Solidification/Stabilization (2)	II	Wide Beach, NY
		IV	Davie Landfill, FL
	Vacuum/Vapor Extraction (1)	V	Verona Well Field, MI
	Biodegradation/Land Application (1)	V	Byron/Johnson Salvage, IL
	Soil Washing/Flushing (2)	II	Goose Farm, NJ
		X	South Tacoma/Well 12-A, WA
	Volatilization/Soil Aeration (2)	I	McKin, ME
		VI	Triangle Chemical, TX

---

[*] Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODS (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY86	Incineration/Thermal Treatment (12)	I	Baird & McGuire, MA
		II	*Hyde Park, NY
		III	Drake, PA
		III	Westline, PA
		IV	Coleman Evans, FL
		IV	Mowbray Engineering, AL[b]
		V	Arrowhead Refinery, MN
		V	Fields Brook, OH[c]
		V	LaSalle Electrical, IL
		V	Metamora Landfill, MI
		V	Spiegelberg Landfill, MI
		VI	Sikes Disposal Pit, TX
	Solidification/Stabilization (9)	II	Marathon Battery, NY
		III	Bruin Lagoon, PA
		IV	Mowbray Engineering, AL[b]
		IV	*Pepper's Steel, FL
		IV	Sapp Battery, FL
		V	Burrows Sanitation, MI
		V	Fields Brook, OH[c]
		V	Forest Waste, MI
		X	*Queen City Farms, WA
	Biodegradation/Land Application (3)	I	Tinkham Garage, NH[b]
		III	Leetown Pesticide, WV
		V	*Burlington Northern, MN
	Soil Washing/Flushing (2)	I	Tinkham Garage, NH[b]
		X	United Chrome, OR
	Volatilization/Soil Aeration (4)	I	Tinkham Garage, NH[b]
		II	Caldwell Trucking, NJ
		II	Metaltec/Aerosystems, NJ
		IV	Hollingsworth Solderless, FL

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODS (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY87	Incineration/Thermal Treatment (13)	I	Davis Liquid Waste, RI[c]
		I	*Ottati & Goss, NH[c]
		II	Williams Property, NJ[c]
		IV	*Geiger (C&M Oil), SC[c]
		IV	*Sodyeco, NC
		IV	Tower Chemical, FL
		V	Laskin/Poplar, OH
		V	Rose Township, MI
		VI	Bayou Bonfouca, LA
		VI	Cleve Reber, LA
		VI	*Gurley Pit, AR[c]
		VI	*Hardage/Criner, OK
		VI	Sand Springs[c] Petrochemical Complex, OK[c]
	Solidification/Stabilization (9)	II	Chemical Control, NJ[c]
		IV	*Geiger (C&M Oil), SC[c]
		IV	*Gold Coast, FL
		IV	Independent Nail, SC
		V	Liquid Disposal Landfill, MI
		V	*Northern Engraving, WI
		VI	*Gurley Pit, AR[c]
		VI	*Mid-South, AR
		VI	Sand Springs[c] Petrochemical Complex, OK[c]
	Vacuum Extraction (1)	V	*Seymour, IN
	Biodegradation/Land Application (1)	II	*Renora, Inc., NJ
	Soil Washing/Flushing (2)	I	Davis Liquid Waste, RI[c]
		IV	Palmetto Wood, SC
	Volatilization/Soil Aeration (2)	I	*Ottati & Goss, NH[c]
		II	*Waldick Aerospace, NJ
	Other Treatment Technologies (4)	I	Resolve, MA
		III	*Palmerton Zinc, PA
		III	*West Virginia Ordnance Works, WV
		VIII	Central City/Clear Creek, CO

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODS (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Incineration/Thermal Treatment (26)	I	* Rose Disposal Pit, MA
		II	Brewster Well Field, NY
		II	Ewan Property, NJ
		II	Lipari Landfill, NJ
		II	Love Canal (10/26/87), NY
		II	Reich Farms, NJ[b]
		II	York Oil, NY[c]
		III	Berk Sand Pits, PA
		III	Delaware Sand & Gravel, DE
		III	Douglassville Disposal, PA
		III	Drake Chemical, PA
		III	Fike Chemical, WV[b]
		III	* Ordnance Works Disposal, WV[d]
		III	Southern Maryland Wood, MD
		III	Wildcat Landfill, DE
		IV	Zellwood, FL[c]
		V	Forest Waste Disposal, MI
		V	Fort Wayne, IN
		V	LaSalle Electrical, IL
		V	Summit National, OH
		VI	* Brio Refining, TX
		VI	Old Midland Products, AR
		VII	Minker Stout/Romaine, MO
		VII	* Syntex Verona, MO
		VII	Times Beach, MO
		VIII	* Broderick Wood, CO
	Solidification/Stabilization (18)	II	Love Canal (09/26/88), NY
		II	Marathon Battery, NY[c]
		II	York Oil, NY[c]
		III	Aladdin, PA
		III	Fike Chemical, WV[b]
		IV	* Chemtronics, NC[d]
		IV	* Flowood, MS
		V	Mid-State Disposal, WI
		V	Velsicol Chemical, IL
		VI	* Bailey Waste Disposal, TX
		VI	* Industrial Waste Control, AR
		VII	Arkansas City Dump, KS
		VII	Midwest Manufacturing, IA
		IX	* Selma Pressure Treating, CA
		X	* Commencement Bay/Nearshore, WA
		X	Frontier Hard Chrome (12/30/87), WA
		X	* Gould, OR
		X	* Pacific Hide & Fur, WA

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

[d] Use of this treatment at the site was retracted in a FY 1989 ROD Amendment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODS (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Vacuum Extraction (10)	I	Groveland Well, MA
		I	Keefe Environmental, NH
		III	*Bendix Flight Systems, PA[c]
		III	*Tyson's Dump (Amendment), PA
		IV	*Airco, KY
		IV	*Goodrich, B.F., KY
		VI	*South Valley (PL-83), NM
		VII	Hastings (09/28/88), NE
		VII	Hastings (09/30/88), NE
		IX	*Motorola, AZ
	Biodegradation/Land Application (6)	I	Iron Horse Park, MA
		III	L.A. Clarke & Son, VA[c]
		IV	*Brown Wood Preserving, FL
		VI	*Atchison/Santa Fe (Clovis), NM
		VI	French Limited, TX
		VI	North Cavalcade, TX
	Soil Washing/Flushing (6)	III	L.A. Clarke & Son, VA[c]
		IV	Zellwood, FL[c]
		V	United Scrap Lead, OH
		V	*U.S. Aviex, MI
		VI	*Koppers/Texarkana , TX
		VI	*South Cavalcade, TX
	Volatilization/Soil Aeration (6)	I	Cannon Engineering, MA
		II	Marathon Battery, NY[c]
		II	Reich Farms, NJ[b]
		III	*Bendix Flight Systems, PA[c]
		IV	*Wamchem, SC
		VI	Long Prairie, MN
	Other Treatment Technologies (4)	II	*GE Wiring, PR
		V	Pristine, OH
		VI	Sol Lynn (03/25/88), TX
		VII	*Fulbright, MO

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODs

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Incineration/Thermal Treatment (30)	I	Baird & McGuire, MA
		I	Pinette's Salvage Yard, ME[c]
		I	Wells G&H, MA[c]
		I	* W.R. Grace (Acton Plant), MA[c]
		II	Bog Creek Farm, NJ
		II	De Rewal Chemical, NJ[c]
		II	* FAA Technical Center, NJ[c]
		II	Fulton Terminals, NY
		III	* Douglassville Disposal, PA
		III	M.W. Manufacturing, PA
		III	Whitmoyer Laboratories, PA[b]
		IV	Aberdeen Pesticides/Fairway Six, NC
		IV	American Creosote Works, TN[c]
		IV	* Celanese (Shelby Fiber Operations), NC[c]
		IV	Newsom Brothers/Old Reichhold, MS
		IV	Smith's Farm, KY[c]
		V	* Alsco Anaconda, OH[c]
		V	* Big D Campground, OH
		V	* Cliffs/Dow Dump, MI[c]
		V	Cross Brothers Pail (Pembroke), IL[c]
		V	* Ionia City Landfill, MI
		V	Laskin/Poplar Oil, OH
		V	* New Brighton/Arden Hills (TCAAP), MN
		V	Ninth Avenue Dump, IN
		V	Outboard Marine (Amendment), IL[b]
		V	Wedzeb Enterprises, IN
		VII	* Vogel Paint & Wax, IA[b,d]
		VIII	* Sand Creek Industrial, CO[c]
		VIII	* Woodbury Chemical, CO
		X	* Northwest Transformer, WA
	Solidification/Stabilization (18)	I	Sullivan's Ledge, MA
		I	* W.R. Grace (Acton Plant), MA[c]
		II	De Rewal Chemical, NJ[c]
		II	Marathon Battery, NY

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODs

(Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Solidification/Stabilization (18) (Continued)	III	• Craig Farm Drum, PA
		III	Hebelka Auto Salvage Yard, PA
		III	• Ordnance Works Disposal Areas (Amendment), WV[c]
		IV	Amnicola Dump, TN
		IV	• Celanese (Shelby Fiber Operations), NC[c]
		IV	Kassouf-Kimerling, FL
		IV	Smith's Farm, KY[c]
		V	• Auto Ion Chemicals, MI
		V	• MIDCO I, IN[c]
		V	• MIDCO II, IN
		VI	Pesses Chemical, TX
		IX	• Coast Wood Preserving, CA
		IX	• Koppers (Oroville Plant), CA[c]
		IX	Purity Oil Sales, CA
	Vacuum/Vapor Extraction (17)	I	Kellogg-Deering Well Field, CT
		I	• South Municipal Water Supply Well, NH
		I	Wells G&H, MA[c]
		II	• FAA Technical Center, NJ[c]
		V	Kysor Industrial, MI
		V	Miami County Incinerator, OH
		V	• MIDCO I, IN[c]
		V	Wausau Water Supply (9/29/89), WI
		VII	Hastings Ground Water, NE
		VIII	• Sand Creek Industrial, CO[c]
		IX	• Fairchild Semiconductor (Mt. View), CA[c] (1st Remedial Action)
		IX	• Fairchild Semiconductor (Mt. View), CA[c] (2nd Remedial Action)
		IX	• Fairchild Semiconductor (S. San Jose), CA
		IX	• IBM (San Jose Plant), CA
		IX	• Intel (Mt. View Plant), CA[c]
		IX	• Litchfield Airport Area, AZ
		IX	• Raytheon (Mt. View Plant), CA[c]

• Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED IN FY 1982-1989 RODs
(Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Biodegradation/Land Application (10)	III	* Ordnance Works Disposal Areas (Amendment), WV[c]
		III	Whitmoyer Laboratories, PA[b]
		IV	American Creosote Works, FL
		V	* Cliffs/Dow Dump, MI[c]
		V	Galesburg/Koppers, IL
		VI	* Sheridan Disposal Services (12/29/88), TX
		VII	* Vogel Paint & Wax, IA[b,d]
		VIII	* Burlington Northern (Somers Plant), MT
		VIII	* Libby Ground Water, MT
		IX	* Koppers (Oroville Plant), CA[c]
	Soil Washing/Flushing (6)	II	Byron Barrel & Drum, NY
		II	Vineland Chemical, NJ[c] (Soil Washing)
		II	Vineland Chemical, NJ[c] (Soil Flushing)
		IV	Cape Fear Wood Preserving, NC
		V	Cross Brothers Pail (Pembroke), IL[c]
		IX	* Koppers (Oroville Plant), CA[c]
	Solvent Extraction (6)	I	Norwood PCBs, MA
		I	* O'Connor, ME
		I	Pinette's Salvage Yard, ME[c]
		II	Ewan Property, NJ
		V	Outboard Marine (Amendment), IL[b]
		VI	United Creosoting, TX
	Volatilization/Soil Aeration (4)	IX	* Fairchild Semiconductor (Mt. View), CA[c] (1st Remedial Action)
		IX	* Fairchild Semiconductor (Mt. View), CA[c] (2nd Remedial Action)
		IX	* Intel (Mt. View Plant), CA[c]
		IX	* Raytheon (Mt. View Plant), CA[c]
	Other/Not Specified Treatment Technologies (9)	I	Saco Tannery Waste Pits, ME
		II	Claremont Polychemical, NY
		II	SMS Instruments (Deer Park), NY
		III	Havertown PCP, PA
		III	Publicker/Cuyahoga Wrecking, PA
		IV	American Creosote Works, TN[c]
		V	* Alsco Anaconda, OH[c]
		VII	* Doepke Disposal (Holliday), KS
		VII	Findett, MO

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* Enforcement-lead RODs.

[a] RODs may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two or more source control treatment technologies.

[d] ROD selected two non-source control measures.

Exhibit 11

OVERVIEW OF FINAL AND INTERIM SOURCE CONTROL ACTION TREATMENT REMEDIES FOR FY 1987-1989

	(A.) UNIVERSE OF SOURCE CONTROL RODs	
FY	RODs Signed	Source Control RODs (Final & Interim Action)
87	76	50
88	153	100
89	143	105

(B.) DATA REPRESENTS A SUBSET OF COLUMN A	
RODs Selecting One or More Treatment Technologies for Source Control	Occurrences of Treatment Technologies Selected for Source Control
27	32
69	76
76	100

(C.) DATA REPRESENTS A SUBSET OF COLUMN B	
RODs Selecting Innovative Treatment Technologies for Source Control	Occurrences of Innovative Treatment Technologies Selected for Source Control
7[a]	7[a]
28[b]	30[b]
40[c]	45[c]

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[a] Includes Resolve, MA, which selected dechlorination of soil.
[b] Includes Sol Lynn, TX (03/25/88), which selected APEG.
[c] Includes Ionia City Landfill, MI and Northwest Transformer, WA, which selected in-situ vitrification; SMS Instruments, NY, which selected in-situ steam stripping; Celanese, NC, which selected chemical fixation of predominantly organic waste; and Fulton Terminals, NY, which selected low temperature thermal treatment.

Exhibit 12

FY 1982-1989 ROD REMEDY COST [a]

	0 - $2M	2.1 - $5M	5.1 - $10M	10.1 - $20M	20.1 - $30M	$30.1M+	TOTAL RODs SIGNED
1982	2	1	1	0	0	0	4
1983	8	2	2	1	0	0	13
1984	18	12	3	3	2	0	38
1985[b]	23	16	11	9	4	3	69
1986	31	14	11	13	6	8	83
1987	25	22	12	6	5	5[c]	77
1988	43	44	31	15	14	6	153
1989	44	23	23	20	7	19	143[d]
TOTAL	194	134	94	67	38	41	580[d]

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[a] Estimates are based on present worth costs when available.
[b] Data are not available for three sites (Harris Farley, TX and two Westinghouse, IN sites that are confidential).
[c] Includes a combined remedial cost for the Envirochem, IN and Northside, IN, which are both represented in one ROD.
[d] Data are not available for seven FY 1989 RODs.

SECTION II

RECORDS OF DECISION ABSTRACTS

ROD summaries are arranged alphabetically by Region. The States in each Region are listed at the beginning of each Region; however, not all States have had a ROD signed in FY 1989.

Each ROD summary presented in this section consists of the following:

- ROD Abstract - summarizing site location and background information, contaminated media, key contaminants, selected remedial action, and present worth or capital costs and O&M costs.
- Performance Standards or Goals - describing qualitative/quantitative cleanup criteria.
- Institutional Controls - describing ordered site restrictions.
- Keywords - highlighting treatment technologies, contaminated media, key contaminants, and major keyword categories for the RODs. A list of RODs by keywords is presented in the last section of this document.

RECORDS OF DECISION ABSTRACTS
FY 1989

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Saco Tannery Waste Pits, ME 41
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AUBURN ROAD LANDFILL, NH
Second Remedial Action - Final
September 29, 1989

The Auburn Road Landfill site consists of four former land disposal areas on 200 acres of land in Londonderry, Rockingham County, New Hampshire. The four disposal areas, referred to as the Old Town Dump (3 acres), the Tire Dump (4 acres), the Solid Waste Area (6 acres), and the Septage Lagoon (1 acre), are sources of soil and ground water contamination at the site. Land bordering the site is occupied primarily by private residences, and includes wetlands, streams, and a pond. In 1979, after verifying that industrial wastes were being disposed of at the site, the State prohibited further disposal of drums. Since 1980, 69 monitoring wells have been installed and numerous test pits have been excavated at the site. In 1986 EPA removed approximately 1,000 drums of waste materials from the site, the majority being removed from the Old Town Dump area. The first operable unit for the site was completed in December 1987, when all residences identified as being potentially impacted by site ground water contamination were connected to a local public water supply. Concurrently the site owner erected a seven-foot high fence around the Old Town Dump, the Tire Dump, and the Solid Waste area. A second drum removal was conducted in October 1988 when EPA removed 16 drums from the Old Town Dump and 300 drums from the Tire Dump. This Record of Decision (ROD) represents the second and third operable units for the site and includes ground water remediation and reducing residual soil contamination which is a contamination source to ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, TCE, and PCE; and metals including arsenic and lead.

The selected remedial action for this site includes downgradient ground water pumping and onsite treatment using chemical coagulation and precipitation to remove metal contaminants and air stripping to remove VOCs (which will be collected in a vapor phase carbon adsorption system) followed by onsite discharge to recharge trenches; ground water monitoring; and placing a multilayered natural and synthetic cap over each source area. The estimated present worth cost for this remedial action is $24,100,000, which includes annual present worth O&M costs of $1,460,000.

PERFORMANCE STANDARDS OR GOALS: Target cleanup levels were selected for ground water treatment that are consistent with drinking water standards set by Safe Drinking Water Act (SDWA) MCLs or proposed MCLs (PMCLS). Chemical-specific ground water goals include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), PCE 5 ug/l (PMCL), TCE 5 ug/l (MCL), arsenic 50 ug/l (MCL), and lead 50 ug/l (MCL). Direct contact, ingestion, and inhalation of soil contaminants and further migration of contaminants to ground water will be prevented by capping.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Arsenic; Benzene; Capping; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Drinking Water Supply; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; Onsite Containment; Onsite Discharge; Onsite Treatment; O&M; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Toluene; VOCs; Wetlands.

BAIRD & MCGUIRE, MA
Third Remedial Action
September 14, 1989

The Baird & McGuire site is a former chemical manufacturing facility in northwest Holbrook, Massachusetts, approximately 14 miles south of

Boston. The 20-acre site is situated in a wetland area within the 100-year floodplain of the Cochato River which lies to the east. From 1912 to 1983 the company operated a chemical manufacturing and batching facility on the property. Manufactured products included herbicides, pesticides, disinfectants, soaps, floor waxes, and solvents. Waste disposal methods at the site included direct discharge into the soil, nearby brook and wetlands, and a former gravel pit (now covered) in the eastern portion of the site. Underground disposal systems were also used. The South Street well field, part of the municipal water supply for Holbrook, is within 1,500 feet of the Baird & McGuire property. The last operating well was shut down in 1982 due to organic contamination which possibly originated from the site. EPA conducted a removal action at the site in 1983 after a waste lagoon overflowed spreading contaminants into the Cochato River. The company ceased operating shortly thereafter. A second removal action was conducted in 1985, following the discovery of dioxin contaminated soil. EPA also conducted an Initial Remedial Measure at the site from 1985 through 1987 which involved constructing a new water main to direct water away from the site, removing building structures, and installing a temporary cap. In 1986 a ROD was signed to address onsite ground water treatment and incineration of contaminated soil. This ROD addresses the Cochato River sediment contamination. The primary contaminants of concern affecting the sediment are organics including PAHs and pesticides, and metals including arsenic.

The selected remedial action for this site includes placement of river silt curtains downstream of the site; excavation and onsite incineration of approximately 1,500 cubic yards of contaminated sediment; backfilling excavated areas with clean fill and onsite placement of treated sediment; restoration of wetland areas; and long-term surface water and sediment monitoring. The estimated present worth cost for this remedial action is $1,656,000, which includes annual O&M costs of $22,000.

PERFORMANCE STANDARDS OR GOALS: Sediment will be treated to a 10^{-5} to 10^{-6} excess cancer-risk level. Chemical-specific goals include DDT 19 mg/kg, chlorodane 5 mg/kg, PAHs 22 mg/kg, and arsenic 250 mg/kg. In addition, environmental exposure to the above contaminants will be reduced to the mean Sediment Quality Criteria which are numerical standards protective of aquatic life and its uses.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Arsenic; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Filling; Floodplain; Incineration; Metals; Onsite Disposal; Onsite Treatment; O&M; PAHs; Pesticides; RCRA; Sediment; Surface Water Monitoring; Treatment Technology; Wetlands.

KELLOGG-DEERING WELL FIELD, CT

Second Remedial Action
September 29, 1989

The Kellogg-Deering Well Field site is a 10-acre contaminated municipal well field in Norwalk, Fairfield County, Connecticut, which includes adjacent source areas that contribute to the well field contamination. The site lies within the Norwalk River's 100-year floodplain and consists of four municipal drinking water wells that supply approximately 25 percent of the water for the 45,000 residents in Norwalk. The city detected elevated TCE levels in the wells during routine monitoring in 1975 and subsequently shut down unacceptably contaminated wells until a redwood slat treatment system was installed in 1981. EPA conducted a remedial investigation between 1984 and 1986 leading to a 1986 ROD which required the city to operate an air stripping unit. EPA conducted a subsequent remedial investigation in 1987 which further defined the contaminated ground water area and identified the Elinco/Pitney Bowes/Matheis Court Complex, located east of the site and upgradient of the well field, as a source of ground water contamination. This ROD, the second of three planned operable units, addresses the major source area. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes.

The selected remedial action for this site includes onsite in-situ vacuum extraction followed by carbon adsorption to remediate soil underlying the major source area at the court complex; ground water pumping and onsite treatment using air stripping followed by offsite discharge; and periodic sampling of ground water, soil vapor, and indoor air. The estimated present worth cost for this remedial action is $9,100,000, which includes a present worth O&M cost of $3,034,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals for ground water cleanup are based on MCLs and include benzene 5 ug/l, toluene 2,000 ug/l, TCE 5 ug/l, and PCE 5 ug/l. EPA has established soil cleanup goals based on a soil leaching model. Chemical-specific soil cleanup goals range depending on the soil type and include benzene 1.2-36.7 ug/kg, toluene 5,523-169,552 ug/kg, TCE 12-358 ug/kg and PCE 33-1,036 ug/kg.

INSTITUTIONAL CONTROLS: Institutional controls will restrict soil excavation and well installation in contaminated areas.

KEYWORDS: Air Monitoring; Air Stripping; Benzene; Carbon Adsorption; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Supply; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Municipally Owned Site; Offsite Discharge; Onsite Treatment; O&M; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs; Wetlands; Xylenes.

NORWOOD PCBs, MA
First Remedial Action - Final
September 29, 1989

The 26-acre Norwood PCBs site consists of several industrial and commercial properties, parking areas, and vacant lots in Norwood, Norfolk County, Massachusetts. Significant site features include the Grant Gear property to the north, an office park complex which extends along the western portion of the site, and residential areas which border the site to the west and north. Meadow Brook, which discharges to the Neponset River, and an associated wooded wetlands area make up the north site boundary. Four piles of sediment sludge, previously dredged from the stream, are located on the south bank of the brook. Site contamination originated from disposal practices of previous businesses, primarily electrical equipment manufacturing, that operated from the building now owned by Grant Gear Realty Trust. In April 1983 the State responded to a citizen report of previous industrial waste dumping at the site and took surficial soil and sediment samples which confirmed PCB contamination. In June 1983 EPA removed 500 tons of PCB-contaminated soil from the office park complex and Grant Gear properties and disposed of it offsite. The State implemented an Interim Remedial Measure in 1986 to limit access to areas with high surface contamination on the Grant Gear property by constructing a 1.5-acre cap. The primary contaminants of concern affecting soil, sediment, ground water, and building surfaces are VOCs including TCE and PCE; other organics including PCBs, PAHs, and phenols; and metals.

The selected source control remedial measures include excavation, solvent extraction, and onsite disposal of approximately 31,000 cubic yards of unsaturated soil and dredge pile sediment and approximately 3,000 cubic yards of Meadow Brook sediment followed by installing a soil cover over the treated soil; offsite incineration and disposal of extracted oils containing PCBs; flushing and cleansing portions of the Grant Gear drainage system; cleaning and sealing roof surfaces, and decontaminating machinery, equipment, and floor surfaces in the Grant Gear building which exceed TSCA cleanup levels; ground water collection in a barrier drain trench with onsite treatment by carbon adsorption for PCBs, air stripping for VOCs removal, and precipitation/filtration for metals removal; wetlands restoration; long-term environmental monitoring of ground water, soil, sediment, and building surfaces; and institutional controls restricting ground water and land use. The estimated present worth cost for this selected remedy is $16,100,000, which includes annual O&M costs for up to 10 years.

PERFORMANCE STANDARDS OR GOALS: To assist in the establishment of cleanup standards, EPA has divided the site into three sections: Section A is the area of soil and dredge sediment north of the Grant Gear fence and adjacent to Meadow Brook; Section B includes areas within the Grant Gear property and surrounding commercial properties; and the final section is the Meadow Brook sediment area. Chemical-specific soil target cleanup levels for Section A are PCBs 1 mg/kg and PAHs 2 mg/kg based on a 7 x 10^{-6} cancer-risk level; and for Section B, PCBs 10 mg/kg (25 mg/kg for soil covered with pavement outside Grant Gear) and PAHs 6 mg/kg based on a 10^{-6} cancer-risk level, and TCE 24 ug/kg and PCE 60 ug/kg based on preventing contamination to ground water above MCLs. The cleanup level for sediment in Meadow Brook is PCBs 1 mg/kg based on 1.5 x 10^{-7} excess cancer-risk level, and PCBs 0.5 ug/kg for discharge to Meadow Brook. Ground water target cleanup levels were established based on Federal and State MCLs for TCE 5 ug/l, PCE 5 ug/l, and four other organics.

INSTITUTIONAL CONTROLS: Controls will be designed to insure that ground water on the zone of contamination will not be used as a drinking water source, and to prevent disturbance of contaminated untreated subsurface soil within the Grant Gear property, sediment in Grant Gear drainage systems and soil under paved areas outside Grant Gear.

KEYWORDS: Air Stripping; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Metals; MCLs; Onsite Discharge; Onsite Disposal; Onsite Treatment; O&M; Organics; PAHs; PCBs; PCE; Phenols; Public Health Advisory; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvent Extraction; State Guidance; State Permit; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands.

O'CONNOR, ME

First Remedial Action - Final
September 27, 1989

The O'Connor site covers a 9-acre area near the city limits of Augusta, Maine. The area neighboring the site consists of woodlands, a small poultry farm, private properties and residences, and wetlands. A portion of the site is also located within a 100-year floodplain. The F. O'Connor Company began operating a salvage and electrical transformer recycling business at the site in the early 1950s. Because of previous oil spills the State investigated the site in 1976 and found the surface water, sediment, and soil contaminated with PCBs. As a result of this study the F. O'Connor Company constructed two surface water impoundments (lagoons) to control further migration of oils from the site. In 1977 the State ordered the F. O'Connor Company to discontinue use of the lagoons. Subsequently the lagoon waters were pumped into several onsite storage tanks and the sediment was excavated, deposited in a low area onsite, and covered with a clay cover. The sediment created a barrier for surface water and formed an upland marsh onsite. In May 1987 EPA and the State jointly issued an amended Administrative Order to F. O'Connor Company requiring field investigations and extensions of the existing fence to areas where additional contamination was found. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including benzene; other organics including PCBs and PAHs; and metals including lead.

The selected remedial action for this site includes pumping and offsite treatment of lagoon and upland marsh surface water; excavation and onsite treatment of approximately 23,500 cubic yards of contaminated soil and sediment using a solvent extraction process followed by onsite disposal of residuals; onsite treatment of gases from the solvent extraction process; extraction and offsite treatment of solvent residues using incineration; onsite treatment by solidification of soil and sediment that do not achieve target cleanup goals after treatment, followed by offsite disposal; backfilling and upgrading the excavated area with clean soil and treated soil; ground water pumping and treatment using activated carbon adsorption followed by onsite reinjection; and sediment and ground water monitoring. The estimated total cost for this remedial action is $14,221,000 which includes annual O&M costs of $56,000 in year 1, $54,000 for years 2-4, $92,000 for year 5, and $65,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Target cleanup goals were based on a 10^{-5} excess cancer risk. Individual goals for soil and sediment include PCBs 1 mg/kg, PAHs 1 mg/kg, and lead 248 mg/kg; for ground water, PCBs 0.5 ug/l, and benzene 5 ug/l; and for surface water, PCBs 0.065 ug/l and lead 1.94 ug/l.

INSTITUTIONAL CONTROLS: Deed and land use restrictions to prohibit ground water use will be implemented.

KEYWORDS: Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; Metals; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; PAHs; PCBs; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Solvent Extraction; State Standards/Regulations; Surface Water; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Wetlands.

PINETTE'S SALVAGE YARD, ME

First Remedial Action - Final
May 30, 1989

The Pinette's Salvage Yard site is approximately one mile southwest of the town of Washburn, Aroostook County, Maine, in the northeast corner of the State. The site consists of a vehicle repair and salvage yard and an adjacent undeveloped area containing wetlands. Land surrounding the site is used for residential, general industrial, and agricultural purposes. An undeveloped forest and a wetlands area are also adjacent to the site. The water supply for the approximately eight to ten residences located within a one-half mile radius of the site is obtained from private wells located in the deep, bedrock aquifer below the site. Municipal wells, used to supply the drinking water to the residents of Washburn, are located one mile northeast of the site. In June 1979 three electrical transformers were removed from Loring Air Force Base by a private electrical contractor and allegedly brought to the site where they ruptured while being moved from the delivery vehicle. Approximately 900 to 1,000 gallons of dielectric fluid containing PCBs spilled directly onto the ground. A removal action was performed in late 1983 which included excavation and offsite disposal of 800 cubic yards of municial PCB-contaminated soil from the site. Subsequent investigations at the site revealed the presence of a wide range of PCB concentrations in the surface and subsurface soils. The highest levels of PCBs are in the general area of the transformer fluid spill. Surface migration of PCBs extends as far as the undeveloped land adjacent to the salvage yard. In addition, soil contaminated with chlorinated benzenes was found in the spill area. The total volume of contaminated soil above 5 mg/kg PCBs and containing other organics is approximately 2,200 cubic yards. Detectable concentrations of PCBs and benzene compounds were identified in both the shallow and deep aquifers localized within and slightly downgradient of the spill area. This remedy is designed primarily to address soil contamination and, to the extent practicable, ground water contamination at the site. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene; organics including PCBs; and metals including lead.

The selected remedial action for this site includes excavation and offsite incineration of 300 cubic yards of soil containing greater than 50 mg/kg PCBs; excavation and onsite solvent extraction of 1,700 to 1,900 cubic yards of soil containing between 5 and 50 mg/kg PCBs and other organic contaminants, with offsite incineration of treatment process effluent and onsite treatment of air emissions; excavation of approximately 500 cubic yards of surface soil containing between 1 and 5 mg/kg PCBs to a minimum depth of 10 inches and placement, along with treated soil, in the area where more highly contaminated soil was excavated, followed by additional soil covering and revegetation; onsite ground water pumping, and collection via interceptor trenches, with treatment using filtration and carbon adsorption, followed by discharge of treated water into the shallow aquifer; access restrictions; institutional controls; and sediment, ground water, and surface water monitoring. The estimated present worth cost for this site is $4,367,000 which includes annual O&M costs of $135,000 for years 1-2, $42,000 for years 3-5, and $20,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Target cleanup goals were established for six soil contaminants including PCBs 5 mg/kg (based on a State cleanup level slightly more stringent than a 10^{-5} excess cancer-risk level) and benzene 260 ug/kg. Target goals were provided for seven ground water contaminants including PCBs 0.5 ug/l (State Maximum Exposure Guidelines), benzene 5 ug/l (MCL), 1,2,4-trichlorobenzene 680 ug/l (based on 2×10^{-2} reference dose level), and lead 5 ug/l (MCL). Due to the technical impracticability from an engineering perspective of obtaining the PCB target cleanup goal in the ground water, EPA is invoking a waiver from compliance with this goal.

INSTITUTIONAL CONTROLS: Institutional controls will be established to prevent use of onsite ground water for drinking water purposes both during and, if necessary, following overall site remediation.

KEYWORDS: Air Monitoring; ARAR Waiver; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; Offsite Disposal; Offsite Treatment; O&M; Onsite Discharge; Onsite Treatment; Organics; PCBs; Plume Management; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Soil; Solvent Extraction; Solvents; State Standards/Regulations; Surface Water Monitoring; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands.

SACO TANNERY WASTE PITS, ME
First Remedial Action - Final
September 27, 1989

The Saco Tannery Waste Pits site is in Saco, Maine, approximately 15 miles southwest of Portland, Maine. The 233-acre site is in a rural area which includes forests and wetlands, and lies within the 100-year floodplain of Stuart Brook. Between 1959 and the early 1980s a leather tannery operator used the site to dispose of process wastes in two 2-acre lagoons and 53 smaller disposal pits. EPA and State investigations in the early 1980s led to a removal response action which included pumping liquids from three waste pits and neutralizing the remaining sludge from the pits. This ROD addresses both source control and ground water remediation and identifies a contingency plan in the event the State legislature fails to enact the necessary institutional controls within two years. The primary contaminants of concern affecting the sediment, sludge, ground water, and surface water are metals including arsenic, chromium, and lead.

The selected remedial action is contingent upon the State enacting legislation within two years designating the site as a permanent conservation area. The remedy includes pumping and offsite treatment and discharge of water from waste pits and lagoons followed by covering and revegetating waste pits, lagoons, and associated wet areas; compensation for six acres of lost wetlands; ground water and surface water monitoring to determine whether contaminants exceed specified action levels which would require further site evaluation; and implementation of institutional controls. If legislation is not passed to restrict future use of the site, a contingency plan will be implemented which includes excavating and solidifying soil and sludge from the waste pits and lagoons with onsite disposal in a RCRA landfill, and ground water and surface water monitoring. The estimated present worth cost for the selected remedial action ranges from $9,211,600 to $10,551,400, which includes present worth O&M costs ranging from $2,500,000 to $3,800,000.

PERFORMANCE STANDARDS OR GOALS: Target cleanup levels were developed for sediment and sludge contaminants which exceed a carcinogenic risk of 10^{-7} or a noncarcinogenic risk greater than a total hazard index of 1.0. Specific cleanup goals include total chromium 2,000 mg/kg (based on the Ecological Risk Assessment), lead 125 mg/kg (health-based State target level), and arsenic 60 mg/kg. Alternate Concentration Levels (ACLs) were established for arsenic in ground water. If other contaminants are detected above MCLs, an evaluation of additional remedial action will be made.

INSTITUTIONAL CONTROLS: If the State designates the site a permanent conservation area, land and ground water use and deed restrictions will be implemented as part of this designation.

KEYWORDS: ACL; Arsenic; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLs; Metals; O&M; Safe Drinking Water Act; Sediment; Sludge; State Standards/Regulations; Surface Water Monitoring; Wetlands.

SOUTH MUNICIPAL WATER SUPPLY WELL, NH

First Remedial Action - Final
September 27, 1989

The 250-acre South Municipal Water Supply Well site is approximately two miles south of the town of Peterborough, in Hillsborough County, New Hampshire. The site includes the Contoocook River, the Noone Pond System, and a wetlands area. Also on the site are the New Hampshire Ball Bearings Incorporated (NHBB) manufacturing facility, several commercial establishments, and several apartments. Land use in the vicinity of the site is rural and undeveloped. Ground water flow beneath the site is generally eastward from the NHBB property towards the South Municipal Well. The town of Peterborough discontinued use of the South Well in May 1983 after the State discovered VOC contamination in water samples taken from the well. Subsequent investigations revealed that a plume of contaminated ground water extended from under the NHBB property to the vicinity of the South Well. VOC contamination was also detected in soil on the NHBB property, and wetlands sediment was found to be contaminated with PCBs, metals, and PAHs. Investigations attributed the contamination to in-house chemical releases that were subsequently washed out through floor drains or slop sinks to outfalls, or washed out through facility doors. Exterior releases contributed to contamination at the site through the draining of a truck-mounted waste solvent tank. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and toluene; the primary contaminants of concern affecting the sediment are organics including PCBs and PAHs, and metals.

The selected remedial action for this site includes ground water pumping from the highly contaminated NHBB area plume and treatment using a phase separation settlement tank/pretreatment system, air stripping, carbon columns for air emission control, and onsite discharge; ground water pumping from the dilute plume outside the NHBB area and treatment using air stripping and carbon columns and onsite discharge; in-situ vacuum extraction of 7,500 cubic yards of contaminated onsite soil; excavation and/or dredging with dewatering of 1,170 cubic yards of wetlands sediment and offsite disposal; wetlands restoration with clean fill, surface contouring, and revegetation; implementation of institutional controls restricting ground water use and well installation; and long-term ground water monitoring. The estimated present worth cost for this remedial action is $7,387,769, which includes an estimated present worth O&M cost of $3,992,105.

PERFORMANCE STANDARDS OR GOALS: Target cleanup levels for ground water were based on SDWA MCLs including PCE 5 ug/l, TCE 5 ug/l, and toluene 2,000 ug/l. Target cleanup levels for soil were established to reduce contaminant migration to ground water and include PCE 4.5 ug/kg, TCE 1.5 ug/kg, and toluene 1,500 ug/kg. Soil target levels will attain a 2.92×10^{-10} excess cancer-risk level. Target cleanup levels for sediment include PAHs 1.1 ug/kg and PCBs 1 ug/kg, which will attain an excess cancer risk of 2.9×10^{-7} for PCBs and 1.3×10^{-6} for PAHs for a total risk of 1.3×10^{-6}.

INSTITUTIONAL CONTROLS: Institutional controls will be established to prevent well use and well installation in areas of contaminated ground water.

KEYWORDS: Air Stripping; Clean Air Act; Clean Water Act; Direct Contact; Dredging; Drinking Water Contaminants; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Metals; Offsite Disposal; Onsite Discharge; Onsite Treatment; O&M; PAHs; PCBs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; TCE; Toluene; Vacuum Extraction; VOCs.

SULLIVAN'S LEDGE, MA

First Remedial Action
June 29, 1989

The Sullivan's Ledge site is a 12-acre disposal area in an urban area of New Bedford, Massachusetts. The site is bordered by a country club and marsh area to the north and small businesses to the east and west. The site was operated originally as a granite quarry and includes four 150 ft. deep quarry pits. Between the 1930s and 1970s, the quarry and adjacent areas were used for disposal of hazardous materials and other industrial wastes. Site investigations conducted in 1986 and 1988 revealed high concentrations of PCBs in soil and sediment, and VOCs and inorganics in on-and offsite ground and surface water. Surface runoff and ground water from the disposal area discharge into the adjacent stream which drains into the country club golf course and the Middle Marsh Wetlands area. In addition, a small portion of the site lies within the stream's 100-year floodplain. EPA concluded that the contamination sources includes onsite soil and PCB-contaminated sediment washed offsite to an adjacent stream and wetland areas, and wastes disposed of in the former quarry pits. This ROD addresses source control and migration management; a subsequent ROD will address the Middle Marsh area. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including benzene and TCE; organics including PCBs and PAHs; and metals including lead.

The selected remedial action for this site includes excavation/dredging of 24,200 cubic yards of soil and 1,900 cubic yards of sediment with onsite treatment using solidification, followed by onsite disposal; construction of an 11-acre impermeable cap; air monitoring; diversion and lining of the stream adjacent to site; active ground water pumping and passive underdrain collection with treatment using oxidation/filtration and UV/ozonation with offsite disposal of contaminated residuals (ground water disposal will be determined after further studies); wetlands restoration/enhancement; sediment, ground water, and surface water monitoring; institutional controls including ground water use and access restrictions. The estimated present worth cost is $10,100,000; O&M costs were included in the present worth cost but were not provided.

PERFORMANCE STANDARDS OR GOALS: Onsite soil cleanup standards for PCBs and PAHs were health-based using a 10^{-5} cancer-risk level and include remediation of soil contaminated with total PCBs above 50 mg/kg and/or total cPAHs above 30 mg/kg. Offsite soil will be tested further before chemical-specific goals are provided; however, offsite soil with PCBs greater than 10 mg/kg (based on a 10^{-5} cancer-risk level) will be excavated and disposed of onsite, and soil with PCBs greater than 50 mg/kg will be solidified onsite. The sediment cleanup standard for PCBs is the interim mean sediment quality criteria (SQC) value of 20 ug/gC. Where total organic carbon (TOC) is less than or equal to 10 gC/kg, target treatment for sediment will be 0.2 mg/kg PCBs. Because of the geology of the deep fractured bedrock and possible presence of dense non-aqueous phase liquids, EPA considers ground water treatment to MCLs technically impracticable. Active ground water collection system cleanup standards for VOCs will reduce VOCs to a range of 1-10 mg/l and/or until an asymptotic curve indicates that no significant concentration reductions are being achieved. Passive ground water collection system cleanup standards will be based on State AWQS.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to prevent the use of ground water for drinking water and to place deed restrictions regulating land use at the site.

KEYWORDS: Air Monitoring; ARAR Waiver; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Dredging; Drinking Water Contaminants; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Wetlands.

W.R. GRACE (ACTON PLANT), MA
First Remedial Action
September 29, 1989

The W.R. Grace (Acton Plant) site is in Acton and Concord, Massachusetts. The American Cyanamid and Dewey & Almy Chemical companies formerly owned the 200-acre site where they manufactured explosives, synthetic rubber container sealant products, latex products, plasticizers, and resins. In 1954 W.R. Grace & Company purchased the property and began producing container sealing compounds, latex products, and paper and plastic battery separators. Effluent wastes from these operations flowed into several unlined lagoons and were later buried in onsite waste areas, including an industrial landfill. After a 1978 investigation revealed that ground water in the vicinity of the site was contaminated with VOCs, W.R. Grace & Company agreed to fully restore the aquifer. An aquifer restoration system was installed in 1985 which recovers and treats ground water under the site's waste disposal areas. Subsequent samplings, however, have indicated that the system has only minimally reduced the ground water contamination at the site. This first operable unit primarily addresses the source contamination and includes minimal modifications to the aquifer restoration system. Further ground water remediation will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil, sediment, and sludge are VOCs including benzene and toluene; other organics; and metals including arsenic.

The selected remedial action for this site includes excavation and offsite incineration of highly contaminated soil and sludge; onsite solidification of less contaminated soil, sludge, and sediment followed by onsite disposal in the landfill and capping of the landfill; covering and monitoring other waste areas; modification to the aquifer restoration system to address air stripper emissions controls; and environmental monitoring. The estimated total cost for this remedial action is $7,058,000, which includes an estimated O&M cost of $2,468,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup goals were established for five indicator compounds to ensure that any further contaminant migration to the ground water will not result in ground water levels exceeding drinking water standards (including MCLs). Chemical-specific goals were provided but specific goals for each contaminant varied depending on the location of the waste area onsite. The overall cumulative risk associated with the soil cleanup levels is 8.34×10^{-7}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Arsenic; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction; Landfill Closure; MCLs; Metals; Offsite Treatment; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Solidification/Stabilization; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; VOCs.

WELLS G&H, MA
First Remedial Action
September 14, 1989

The Wells G&H site encompasses 330 acres within the zone of contribution of two municipal drinking water wells known as Well G and Well H, commonly referred to as Wells G&H, in Woburn, Massachusetts. The area near the wells consists of industrial, commercial, residential, and recreational development. The Aberjona River flows through the site, and a substantial onsite wetlands area is associated with the river's floodplain. Wells G&H were developed in the 1960s and provided over one quarter of the Woburn community water supply. In 1979 the State closed the wells and provided the community with an alternate water supply after detecting several chlorinated VOCs in the wells. EPA investigations beginning in 1981 resulted in the site being divided into three discrete operable units: first, five properties inside the perimeter of the site boundary which were identified as source areas of contamination; second, a central area immediately surrounding Wells G&H with extensive ground water contamination; and third, a segment of the Aberjona River and associated wetlands containing contaminated sediment. Between 1983 and 1989 EPA issued several Administrative Orders to site property owners requiring cleanup activities including limiting site access and removing drums and debris. This ROD addresses remediating contaminated soil and ground water found at the first operable unit, the five properties identified as principal sources of contamination, and further evaluating the remaining operable units. A subsequent ROD will address the second and third operable units which include the central area of the site and the river sediment. The primary contaminants of concern affecting the soil, sludge, debris, and ground water are VOCs including PCE and TCE; other organics including cPAHs, PCBs, and pesticides; and metals including lead.

The selected remedial action for this site includes in-situ volatilization, using carbon adsorption for treatment of the extracted vapor, of the 7,400 cubic yards of soil contaminated with VOCs only; excavation and onsite incineration of 3,100 cubic yards of the remaining contaminated soil and backfilling the excavated areas; ground water pumping and treatment in the five source areas, using pretreatment for metals followed by air stripping and vapor phase carbon filtering with either discharge onsite to the Aberjona River or reinjection into the aquifer or both; removing and disposing of 410 cubic yards of sludge and debris; and ground water monitoring. The estimated present worth cost for this remedial action is $68,400,000.

PERFORMANCE STANDARDS OR GOALS: Three approaches were used to determine soil cleanup levels. The first approach was based on protecting ground water from VOC contamination from the soil and includes individual goals for soil of PCE 36.7 ug/kg and TCE 12.7 ug/kg. The second approach was based on a 10^{-6} cancer-risk level and includes individual goals for cPAHs 0.694 mg/kg, PCBs 1.04 mg/kg, and 4-4 -DDT 23.5 mg/kg. The third approach established a cleanup goal for lead at 640 mg/kg based on a target blood lead level of 10 ug/dl. Ground water cleanup goals for the aquifer were established at MCLs and include PCE 5 ug/l (based on TCE) and TCE 5 ug/l. Effluent levels for discharge to the Aberjona River were based State AWQSs; if discharge is to the aquifer, MCLs will be met.

INSTITUTIONAL CONTROLS: EPA recommends that deed and land use restrictions be implemented to restrict use of the aquifer in the vicinity of the site.

KEYWORDS: Air Stripping; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; RCRA; Safe Drinking Water Act; Sludge; Soil; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Volatilization/Soil Aeration; VOCs; Water Quality Criteria; Wetlands.

RECORDS OF DECISION ABSTRACTS
REGION II
(New Jersey, New York, Puerto Rico, Virgin Islands)

BEC TRUCKING, NY
First Remedial Action - Final
September 28, 1989

The BEC Trucking site, also known as the Binghamton Equipment Company, is in the town of Vestal, Broome County, New York. The 3.5-acre site is an open lot which overlies a Class II aquifer. Land use neighboring the site is primarily commercial/industrial, but includes wetlands or marsh area to the west. Prior to the mid-1960s, the BEC Trucking site was an unimproved marshland. The original owner, Haial Trucking, filled some of the marshlands with various fill materials, including fly ash from a local power company. BEC Trucking, Haial Trucking's successor, operated a combination truck body fabrication and truck maintenance facility. Paint thinners and enamel reducers, used during operations, and waste hydraulic oil and waste motor oil reportedly generated during operations were stored in a drum storage area on the western portion of the site. A 1982 State inspection identified approximately 50 drums, 20 of which contained waste engine or cutting oils, enamel reducers, paint thinners, and waste solvents. The drums in the storage area were removed in 1983 along with some stained soil around the drums. In 1988 extensive sampling of ground water, surface water, and soil revealed low-level contamination. The suspected source of onsite ground water and surface water contamination appears to be a leaking underground storage tank on a neighboring property. Remedial activities are currently being undertaken at the neighboring site to address any ground water or surface water contamination at the site resulting from the tank's leakage.

The selected remedial action for this site is no further action. A monitoring program will be established to ensure that this remedy continues to be protective of human health and the environment. The estimated cost for this remedial action will be determined during the development of the proposed monitoring program.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy; Surface Water Monitoring.

BOG CREEK FARM, NJ
Second Remedial Action - Final
June 28, 1989

The Bog Creek Farm site is a 4-acre disposal area consisting of a man-made pond, bog, and trench in Howell Township, Monmouth County, New Jersey. The site is bordered to the north by Squankum Brook, to the west by two residences and a riding stable, and to the south and north by open fields. Between 1973 and 1974 organic solvents and paint residues were dumped around a trench in the eastern portion of the property, creating a highly contaminated soil area. Some chemicals migrated into a shallow underlying aquifer, creating a contaminant plume that discharged to the pond and bog along the northern border of the site and to the north branch of Squankum Brook. In late 1974 the property owner removed some waste from the disposal trench and covered the trench under direction from the Howell Township Health Department. A 1985 ROD selected a first operable unit remedy that involved excavating the soil from the waste trench, pond, and bog areas and incinerating the soil onsite. This second operable unit focuses on remediating the contaminated ground water in the shallow aquifer and the contaminated brook sediment. The primary contaminants of concern affecting the sediment and ground water are VOCs including benzene, toluene and xylenes; other organics including phenols; and metals including lead.

The selected remedy for this site includes ground water pumping and treatment using air stripping, hydrogen peroxide/ultra violet photolysis oxidation, carbon adsorption, and reinjection;

excavation of 90 cubic yards of brook sediment, followed by onsite incineration and onsite disposal; and stream bed restoration using clean sand or soil of similar consistency to the existing material. The estimated present worth cost for this remedial action is $6,927,000, which includes annual O&M costs of $663,000 for ten years of ground water treatment.

PERFORMANCE STANDARDS OR GOALS: Because there is no human exposure to contaminated ground water, the cleanup goals are based on protection of the surface water (north branch of Squankum Brook) rather than human consumption of ground water. The goals are derived from limits that would allow for surface water discharge under a State NPDES permit. Chemical-specific goals include petroleum hydrocarbons 15 mg/l, total lead 56 ug/l, benzene 5 ug/l, toluene 74 ug/l, and phenol 47 ug/l. Individual contaminant goals were not specified for brook sediment.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Carbon Adsorption; Carcinogenic Compounds; Excavation; Ground Water; Ground Water Treatment; Incineration/Thermal Destruction; Onsite Discharge, Onsite Disposal; Onsite Treatment; O&M; Organics; Phenols; Sediment; State Permit; State Standards/Regulations; Toluene; VOCs; Wetlands; Xylenes.

BYRON BARREL & DRUM, NY

First Remedial Action - Final

September 29, 1989

The Byron Barrel & Drum site is in Genesee County, New York, and occupies approximately two acres of an eight-acre tract of land. The rural area surrounding the site includes woods, wetlands and agricultural land, with approximately 320 people living within a one-mile radius of the site. The site is a former salvage yard for heavy construction equipment, some of which remains onsite along with other debris. From 1978 to 1980 the site owner reportedly abandoned approximately 200 barrels of hazardous waste without a permit. Some drums were reportedly ripped open, causing the hazardous waste to mix with the soil, and ultimately to be buried onsite. The State and EPA discovered these barrels in 1982 and initiated an investigation which resulted in the removal and disposal of the drums and approximately 40 cubic yards of contaminated soil and debris. A subsequent remedial investigation in 1987 revealed that solvent spills have contaminated two major areas of the site, resulting in soil and ground water contamination. This remedial action addresses the two contaminated ground water plumes and residual soil contamination which have been releasing contaminants into the ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs, and phenols; and metals including chromium and lead.

The selected remedial action for this site includes pumping and treatment of ground water using precipitation, sedimentation, and filtration to remove metals, and air stripping and carbon adsorption to remove organics, followed by reinjection into the aquifer and, if necessary, offsite discharge of excess treated water; disposal of ground water residues at an offsite RCRA-permitted facility; in-situ soil flushing of 4,100 cubic yards of contaminated soil; further evaluation of 1,100 cubic yards of inorganic contaminated soil to determine ultimate disposal; dismantling and decontaminating debris followed by offsite disposal; and air and ground water monitoring. The estimated present worth cost for this remedial action is $5,572,000, which includes annual O&M costs of $259,700.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet State and Federal ARARs including MCLs. Specific ground water cleanup levels include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), xylenes 440 ug/l (MCL), PCE 5 ug/l (based on TCE MCL), and TCE 5 ug/l (MCL). Soil will meet site-specific action levels, which will ensure that organic and inorganic contaminants will not leach into the ground water at levels above MCLs. Specific soil cleanup levels include toluene 45,000 ug/kg, xylenes 8,200 ug/kg, PCE 140 ug/kg, and TCE 47 ug/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Debris; Decontamination; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Treatment; Organics; PAHs; PCE; Phenols; Plume Management; Safe Drinking Water Act; Soil; Soil Washing/Flushing; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

CALDWELL TRUCKING, NJ

Second Remedial Action

September 28, 1989

The 11-acre Caldwell Trucking site is in Fairfield Township, Essex County, New Jersey. The site is situated on an extensive 100-year floodplain of the Passaic River and neighbors Deepavaal Brook and numerous wetlands, as well as residential and commercial properties. From the 1950s to 1984 the Caldwell Trucking Company dumped, and allowed others to dump, septic wastes into unlined lagoons and later into steel holding tanks at the site. An EPA investigation conducted between 1984 and 1986 revealed that onsite soil and a municipal well were contaminated with VOCs, PCBs, and metals. The investigation resulted in a 1986 ROD which provided for soil remediation, restoration of a municipal well, and residential hookups to municipal water. Ground water, however, remains contaminated because of a TCE-contaminated plume which extends 4,000 feet from the site towards the Passaic River. Additional sources of the plume have been identified, including the neighboring General Hose facility which will be addressed by other Federal and State authorities. A small seep to Deepavaal Brook's tributary, which is recharged by ground water, is also contaminated with TCE. This response is the second remedial action and addresses the remediation of contaminated offsite ground water. The primary contaminants of concern affecting the ground water are VOCs including TCE.

The selected remedial action for this site includes pumping and treatment of offsite ground water using air stripping with offsite discharge to the Passaic River; installation of a drainage system to eliminate surface exposure to contaminated ground water; sealing ground water wells; and ground water monitoring. The estimated present worth cost for this remedial action is $11,540,000 which includes annual O&M costs of $315,000 for 30 years. If, however, access to private properties and public roads needed for implementation of this remedial action cannot be obtained, EPA and the State will implement a contingency remedy which includes limited treatment of ground water, remediation of surface water, and sealing ground water wells.

PERFORMANCE STANDARDS OR GOALS: This operable unit invokes a waiver from Federal and State drinking water standards based on technical impracticability, because it would take more than 100 years of pumping and treatment to attain State drinking water standards (e.g., TCE 1 ug/l). Instead, the remedy will achieve interim cleanup levels which allow for potable use of ground water with minimal treatment. Air emissions and effluent discharges from the treatment facility will comply with State ARARs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARAR Waiver; Carcinogenic Compounds; Contingent Remedy; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Onsite Treatment; Plume Management; Safe Drinking Water Act; Sole-Source Aquifer; State Standards/Regulations; TCE; VOCs; Wetlands.

CHEMICAL INSECTICIDE, NJ

First Remedial Action

September 29, 1989

The Chemical Insecticide site is part of a 94-acre industrial development in Edison, Middlesex County, New Jersey. From 1958 to 1970 Chemical Insecticide Corporation (CIC) produced and stored pesticide formulations at the property resulting in soil, surface water, and ground water contamination. The site is currently vacant and consists of the remaining building foundations, asphalt roadways, a one-acre wetlands area, and a surface water drainage ditch bordering the site to the east, which ultimately drains into the Raritan River. Between 1966 and 1969 CIC was ordered by the city to close onsite lagoons, dispose of leaking drums, and stop wastewater discharge. Subsequent remedial investigation/feasibility study (RI/FS) investigations revealed the extreme complexity of the site remediation due to the number and variety of contaminants (herbicides, pesticides, and metals) and the physical characteristics of the site. To address concerns relating to high levels of contamination in the drainage ditch, EPA installed a fence to limit access to the ditch, in 1988 and subsequently removed contaminated surface water run-off that had collected in a parking lot onsite, and repaired the ditch to prevent future overflow incidents. This operable unit represents an interim remedial action to address contaminated surface water run-off from the site until the source of contamination, the soil, is remediated. Future operable units will address contaminated soil and ground water. The primary contaminants of concern in the soil which may affect the surface water are organics including pesticides, and metals including arsenic.

The selected remedial action for this site includes clearing and grading the site; covering the entire site with an impermeable surficial cap; constructing a surface water run-off diversion system; controlling the release of collected, uncontaminated surface water run-off from the site; and surface water monitoring. The estimated present worth cost for this remedial action is $1,420,211, which includes annual O&M costs of $37,184.

PERFORMANCE STANDARDS OR GOALS: The selected remedy does not provide for treatment; rather it requires monitoring of collected surface water and provides values of allowable discharge to the storm drainage system. Chemical-specific discharge levels were provided based on State standards including arsenic 50 ug/l (based on State WQS), and five pesticides.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Direct Contact; Interim Remedy; Metals; Organics; O&M; Pesticides; Public Health Advisory; State Permit; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring; Wetlands.

CIBA-GEIGY, NJ

First Remedial Action

April 24, 1989

The Ciba-Geigy site is in Dover Township, Ocean County, New Jersey. The site covers 1,400 acres, 320 of which are developed; the remaining area is largely wooded. The site is bounded by industrial, commercial, residential, and recreational areas. The Toms River, which derives surface water primarily through ground water baseflow, runs through the northeast sector of the property. The aquifer system in the site area is tapped by municipal, industrial, and private wells. The manufacturing facility, presently owned by Ciba-Geigy Chemical Corporation, has been in operation since 1952 and is composed of numerous buildings, an industrial wastewater treatment plant, and a lined reservoir for emergency storage of treated and untreated wastewater. From 1952 to 1988, a variety of synthetic organic pigments, organic dyestuffs and intermediates, and epoxy resins were manufactured at the site. The company disposed of chemical wastes onsite in several locations, including a 5.2-acre drum disposal area (containing approximately 100,000 drums); a 3.9-acre lime sludge disposal area (used for disposal of inorganic wastes); a 12-acre filtercake disposal area (which received sludge from the wastewater treatment); five backfilled lagoons comprising 8.5 acres; and a calcium sulfate disposal area. The drum disposal area and lime sludge disposal area were closed and capped in 1978. About this time, the filtercake disposal area was also closed and covered with soil. Ground water contamination is migrating from these inactive disposal sites easterly towards the Toms River. Currently, the company generates both liquid and solid wastes. The liquid wastes are treated onsite in a wastewater treatment plant before discharge to the Atlantic Ocean. The solid wastes are disposed of offsite, and sludges from the wastewater treatment plant are disposed of in a permitted, double-lined, onsite landfill. EPA began investigating the site in 1980. Throughout its operation, the facility has routinely violated treatment and disposal permits, including accepting hazardous offsite waste beginning in 1981. The landfill reportedly was leaking as early as 1981, precipitating remedial measures by the State including issuance of a consent order forcing Ciba-Geigy to close part of the landfill and monitor ground water and leachate. In 1984, after discovering that Ciba-Geigy was illegally disposing of drums containing liquids and hazardous waste in the landfill, the State ordered Ciba-Geigy to remove 14,000 drums. In 1985, leaking equalization basins associated with the wastewater treatment plant led to Ciba-Geigy closing the basins and beginning remediation of the contaminated plume from these basins. Currently, contaminants are present in leaking drums, waste sludges, soil, and ground water. This ROD addresses the first operable unit focusing on the remediation of ground water contamination in the upper aquifer. Remediation of the onsite source areas and deeper aquifer (if needed) will be addressed in future operable units. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and toluene; and metals including arsenic and chromium.

The selected remedial action for this site includes sealing contaminated residential irrigation wells; on- and offsite ground water pumping with onsite treatment using filtration, reverse osmosis, and GAC in an upgraded version of the Ciba-Geigy wastewater treatment plant, followed by temporarily retaining the ground water in basins for monitoring and subsequent discharge to the Toms River; and implementation of a river and ground water monitoring program. The estimated present worth cost for this remedial action is $164,500,000, which includes annual O&M costs of $12,539,000.

PERFORMANCE STANDARDS OR GOALS: Ground water will comply with all Clean Water Act (CWA) requirements and will be treated to meet the proposed State Surface Water Quality Standards including benzene 1 ug/l, PCE 1 ug/l, TCE 1 ug/l, toluene 26 ug/l, total chromium 50 ug/l, and arsenic 50 ug/l. The State MCLs will be attained for the aquifer. Specific goals for the aquifer include benzene 1 mg/l, PCE 1 mg/l, TCE 8 mg/l, and chromium 0.05 mg/l. For unregulated VOCs in the aquifer, single contaminant levels for carcinogens are not to exceed 5 ug/l, and single contaminant levels for possible carcinogens or noncarcinogens are not to exceed 50 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carbon Adsorption; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Safe Drinking Water Act; State Standards/Regulations; TCE; Temporary Storage; Toluene; VOCs; Wetlands.

CLAREMONT POLYCHEMICAL, NY

Second Remedial Action - Final
September 22, 1989

The Claremont Polychemical site is a 9.5-acre abandoned chemical production facility in Oyster Bay, Nassau County, New York. Land use in the area is devoted primarily to light industrial and commercial operations. Contamination at the site took place between 1968 and 1980 and resulted from ink and pigment manufacturing operations, which generated wastes including organic solvents, resins, and wash wastes. The site consists of a one-story building with a contaminated sump, five 5,000-gallon wastewater treatment basins containing sludge, and six above-ground tanks, three of which still contain waste materials. The initial discovery of site contamination occurred in 1979 when the county found 2,000 to 3,000 waste drums, some uncovered and others leaking. By the following year many of these drums were either removed or reused in the plant; however, the county had by this time identified an area of organic solvent contamination east of the building. Subsequently, a 10-foot layer of soil in the area of contamination was excavated and placed on a plastic liner. The liner has since deteriorated and monitoring has identified ground water contamination under the site. In October 1988 a removal action was conducted which included the removal of liquids in the treatment basins and the classification, separation, and storage of the approximately 700 bags and drums of waste. The first operable unit for this site will address soil and ground water contamination and will be initiated after the second operable unit. This second operable unit addresses the wastes in containers above-ground tanks, wastewater treatment basins, and a sump. The total volume of wastes at the site could be as high as 100,000 pounds of solid materials, 10,000 gallons of liquids, and 25,000 pounds of sludge. The primary contaminants of concern in drummed and packaged liquids and solids, and in treatment basin sludge are VOCs including benzene, toluene, TCE, and PCE; other organics; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes compatibility testing on the contents of each treatment basin, above-ground tank, sump, drum, bulking and consolidation of compatible wastes and pumping the contents of the above-ground tanks, treatment basins, and sump into storage tanks; analytical testing of composite samples of drums or bulked wastes to determine appropriate treatment or disposal methods; and transporting the wastes for offsite treatment or disposal as appropriate. The estimated present worth for this remedial action, assuming treatment using incineration, is $1,339,000 with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The RCRA-listed wastes will be treated using the best demonstrated available technology or treated to attain specific treatment levels, as appropriate, to comply with RCRA land disposal restrictions. Chemical-specific levels were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; Arsenic; Benzene; Chromium; Consolidation; Debris; Direct Contact; Lead; Metals; Offsite Disposal; Offsite Treatment; Organics; PCE; RCRA; Sludge; State Standards/Regulations; TCE; Toluene; VOCs; Xylenes.

CLOTHIER DISPOSAL, NY

First Remedial Action - Final
December 28, 1988

The Clothier Disposal site is located in a rural area near the town of Granby, Oswego County, New York. It is a privately owned, 15-acre parcel of land, of which approximately 6 acres have been used for waste disposal. Land use in the vicinity of the site is predominantly agricultural. A wetland passes through the site to the west of the area used for waste disposal. Ox Creek also flows through the site in a northerly direction, feeding into the Oswego River, and a portion of the site is located within the 100-year floodplain. Ground water flow patterns clearly indicate that flow is toward Ox Creek. In 1973, drums of chemical waste were discovered on the Clothier property, despite State denial of a landfill permit application. After the New York Department of Environmental Conservation brought suit, the owner made several attempts to clean up the property. These attempts, however, resulted in drums being broken and drained. Subsequently, additional dumping of roofing materials, household wastes and junked vehicles occurred at the site. Based on data from the remedial investigation and State sampling, EPA established the need for a removal action for 2,200 drums located onsite. A number of potentially responsible parties under an administrative order on consent removed 1,858 drums. EPA removed the remaining drums and visibly contaminated surficial soil and debris associated with the drums. This remedy addresses the low-level residual soil contamination remaining onsite. If the results of ground water, surface water and sediment sampling determine a need to remediate the ground water and/or the wetland, a subsequent operable unit remedy will be undertaken. The primary contaminants of concern affecting the soil are VOCs including toluene, xylenes, and PCE; other organics including PAHs, PCBs and phenols; and metals.

The selected remedial action for the site includes placement of a one-foot soil cover over the contaminated areas and regrading and revegetation of the site; installation of rip-rap, as needed, on the embankment sloping towards Ox Creek to prevent soil erosion; construction and post-construction air monitoring; implementation of institutional controls preventing the utilization of the underlying ground water, or any land use involving significant disturbance of the soil cover; and long-term ground water, surface water, soil, and sediment monitoring. The estimated present worth cost for this remedy is $500,000, which includes annual O&M costs of $27,000.

PERFORMANCE STANDARDS OR GOALS: Because the remedy addresses containment, chemical-specific standards or goals are not applicable.

INSTITUTIONAL CONTROLS: Well restrictions will prevent the use of underlying ground water. Land use restrictions on residential use, or any use involving excavation at the site or significant disturbance of the soil cover will be implemented. Any institutional controls, including but not limited to deed restrictions or easements, shall be consistent with State law.

KEYWORDS: Air Monitoring; Carcinogenic Compounds; Direct Contact; Floodplain; Ground Water Monitoring; Institutional Controls; Metals; O&M; Organics; PAHs; PCBs; PCE; Phenols; Soil; Surface Water Monitoring; Toluene; Toxic Substances Control Act; VOCs; Wetlands; Xylenes.

DE REWAL CHEMICAL, NJ
First Remedial Action
September 29, 1989

The De Rewal Chemical site is in Kingswood Township, Hunterdon County, New Jersey. The 3.7-acre site lies within the 100-year floodplain of the Delaware River and consists of a former dumping area, a garage, a private residence, and a building formerly occupied by the De Rewal Chemical Company. Between 1970 and 1973 the De Rewal Chemical Company reportedly manufactured and stored a textile preservative and an agricultural fungicide onsite. The State discovered De Rewal Chemical Company's improper chemical handling practices in 1972 but was unsuccessful in forcing the company to comply with permit requirements. The De Rewal Chemical Company continued to improperly dump chemicals onsite including one incident in which a tank truck containing 3,000 to 5,000 gallons of highly acidic chromium solution was allowed to drain onto the soil and eventually to the Delaware River. In 1973 the State ordered the company to excavate and place contaminated soil on an impermeable liner. The company reportedly only placed a portion of the contaminated soil on an uncovered plastic sheet before filing for bankruptcy. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and toluene; other organics including PAHs; and metals including chromium and lead.

The selected remedial action for this site includes excavation of 8,000 cubic yards of soil with onsite thermal treatment of 2,100 cubic yards of organic-contaminated soil followed by solidifying the soil and ash residue along with the remaining 5,900 cubic yards of inorganic-contaminated soil and onsite disposal; monitoring and controlling air emissions generated during thermal treatment; pumping and offsite treatment of perched zone ground water at an offsite industrial wastewater treatment facility; ground water monitoring; provision of a treatment system for the onsite residential well; temporarily relocating onsite residents; and preparing a cultural resources survey to ensure compliance with the National Historic Preservation Act. The estimated present worth cost for the selected remedial is $5,097,000, which includes O&M costs of $865,400.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil which exceeds State action levels will be excavated and treated to meet State action levels. Specific soil cleanup goals include total VOCs 1 mg/kg, chromium 100 mg/kg, and lead 250 mg/kg. Ground water will be treated to meet State SDWA MCLs. Specific ground water cleanup goals include TCE 1 ug/l, PCE 1 ug/l, chromium 50 ug/l, and lead 50 ug/l.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented restricting further property use to ensure the integrity of the solidified mass.

KEYWORDS: Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment;

Incineration/Thermal Treatment; Institutional Controls; Leachability Tests; Lead; MCLs; Metals; Offsite Discharge; Offsite Treatment; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCE; Relocation; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/Regulations; TCE; Temporary Storage; Toluene; Treatment Technology; VOCs.

EWAN PROPERTY, NJ
Second Remedial Action - Final
September 29, 1989

The 43-acre Ewan Property site is in the New Jersey Pinelands in Shamong Township, Burlington County, New Jersey. The site neighbors forests and forested wetlands, farmland, and residences. An aquifer underlying the site contains a plume contaminated by onsite disposal practices. Between 1974 and 1975 the site owner reportedly buried uncontained and drummed hazardous wastes in an onsite disposal area. In 1982 the county was informed of the possible hazardous waste dumping and initiated ground water monitoring and soil sampling programs the following year. Both the ground water and soil within the disposal area were found to be contaminated with VOCs and metals. This remedial action represents the second of two operable units for the site. The 1988 ROD addressed the treatment of 4,500 cubic yards of source waste including buried drums and other heavily contaminated materials. This second operable unit addresses the remediation of the residual soil which will remain after implementation of the first operable unit and the treatment of the contaminated ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; and metals including chromium and lead.

The selected remedial action for this site includes excavating and treating 22,000 cubic yards of soil using solvent extraction and soil washing, followed by redepositing treated soil onsite as clean fill; treating and disposing of spent solvent offsite; treating spent wash water onsite using the ground water treatment system; regrading and revegetating disposal areas; pumping and treatment of ground water followed by reinjecting treated ground water into the underlying aquifer; and environmental monitoring. The estimated present worth cost for this remedial action is $35,152,447 which includes annual O&M costs of $1,903,980.

PERFORMANCE STANDARDS OR GOALS: Soil will be treated to meet State Solid Waste Regulations and concentrations that would not deteriorate ground water above ground water remedial objectives. No specific levels for soil were provided. Ground water will meet State water quality criteria (SWQC) to protect ground water in the New Jersey Pinelands and Federal and State MCLs to protect drinking water supplies. Specific ground water treatment levels include benzene 1 ug/l (SWQC), TCE 1 ug/l (SWQC), toluene 2,000 ug/l (PMCL), xylenes 44 ug/l (SWQC), lead 50 ug/l (MCL), and chromium 50 ug/l (SWQC).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Carcinogenic Compounds; Chromium; Clean Closure; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Disposal; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; Solvent Extraction; State Standards/ Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; VOCs; Wetlands; Xylenes.

FAA TECHNICAL CENTER, NJ
First Remedial Action
September 26, 1989

The 5,000-acre multipurpose FAA Technical Center site is a Federal Facility eight miles northwest of Atlantic City, in Atlantic County, New Jersey. The site includes a jet fuel farm, an air terminal, a State national guard fighter group, the extensive facilities of the FAA Technical Center, and the Upper Atlantic City Reservoir. Atlantic City's municipal water supply is provided by nine ground water supply wells located just north of the reservoir on FAA property as well as by water drawn directly from the reservoir. Land use in the site vicinity includes forested land and commercial and residential areas. There are 25 known areas of contamination at the FAA Technical Center. This is the first ROD for an area of contamination at this facility. Further areas of contamination will be addressed in future RODs. Soil and ground water at the site are contaminated with VOCs apparently attributable to the jet fuel farm. Subsurface jet fuel contamination is probably the result of leaking pipes, storage tanks, and spills associated with above-ground and underground storage tanks, associated valves, piping, and dry wells, or a truck loading stand. As an interim remedial measure, free product recovery pumps were installed in 1988-89 in three onsite wells to recover the hydrocarbon plume floating on the water table. Product is currently being extracted and incinerated offsite. The total volume of spilled free product has been estimated at 360,000 gallons, the total volume of contaminated soil found in two hot spot areas was estimated to be 33,000 cubic yards, and the total volume of contaminated ground water was estimated to be 13,300,00 gallons. The jet fuel farm will be closed within the next year as new facilities come on line. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, and xylenes; and other organics including PAHs (naphthalene) and phenols.

The selected remedial action for this site includes in-situ soil vacuum extraction (soil venting) and off-gas treatment using either incineration or activated carbon adsorption; extraction of free product floating on the plume followed by offsite incineration; ground water extraction and addition of nutrients for subsequent reinjection and in-situ biodegradation of residual ground water contamination; and ground water monitoring. The estimated present worth cost for this remedial action is $583,000, which includes a total present value O&M cost of $200,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels are based on State and Federal MCLs, whichever is more stringent, and include benzene 1 ug/l (State MCL), xylenes (total) 44 ug/l (State MCL), and toluene 2,000 ug/l (Federal MCL). Total phenols will meet the State Ground Water Quality Standard of 300 ug/l. The soil cleanup levels are based on State Soil Cleanup Action Levels, which are TBCs, and include 1 mg/kg for total priority pollutant VOCs. For total petroleum hydrocarbons the action level is 100 mg/kg. No chemical-specific ARARs for soil contaminants were identified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Carcinogenic Compounds; Clean Air Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Safe Drinking Water Act; Soil; State Guidance; State Standards/Regulations; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

FULTON TERMINALS, NY

First Remedial Action - Final
September 29, 1989

The 1.6-acre Fulton Terminals site is in Fulton, Oswego County, New York. The site is bordered to the west by the Oswego River, and a section of the site lies within the river's 100-year floodplain. Commercial and industrial operations are the primary land uses in the vicinity of the site. Spills and leaks of chemical wastes stored in eight tanks at the site resulted in soil and ground water contamination. The wastes were produced by a combination of former asphalt and roofing manufacturing operations conducted from 1936 to 1960, and a more recent hazardous waste storage operation. From 1972 to 1977 Fulton Terminals, Inc., operated a staging and storage area for hazardous wastes destined for offsite incineration. In 1981, following a citation for not meeting Federal and State standards for the operation of a hazardous waste storage facility, Fulton Terminals initiated a cleanup which included emptying and removing four storage tanks. From June 1986 to May 1987 EPA and the proposed responsible parties (PRPs) undertook removal activities which included securing the site, removing all remaining storage tanks, excavating and removing approximately 300 cubic yards of contaminated soil and tar-like waste, and partially removing and plugging a storm sewer pipe running to the Oswego River. This remedy addresses the low levels of soil contamination remaining at the site and a plume of contaminated ground water which threatens the Oswego River. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, TCE, and xylenes; other organics including PAHs; and metals including arsenic.

The selected remedial action for this site includes excavation and low temperature thermal treatment of approximately 4,000 cubic yards of contaminated soil and backfilling the treated soil provided it passes the TCLP Toxicity Test; placement of a one foot cap of clean top soil over the site; ground water pumping and treatment onsite using air stripping and carbon adsorption, followed by reinjection or other type of recharge into the aquifer; disposal of soil and ground water treatment waste residues at a RCRA-approved offsite hazardous waste facility; air monitoring; and ground water monitoring for three years. The estimated present worth cost for this remedial action is $4,031,000, which includes an annual O&M cost of $732,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS: Soil treatment levels are designed to prevent leaching to ground water that will result in levels above MCLs. Chemical-specific soil goals include TCE 2 mg/kg, benzene 1.4 mg/kg, and xylenes 8 mg/kg. Ground water cleanup levels will meet the more stringent of Federal and State drinking water standards, including TCE 5 ug/l (MCL) and arsenic 1,000 ug/l (MCL). Several contaminants such as benzene, xylenes, and certain metals may exceed drinking water standards at the end of remediation because they are detected at higher concentrations upgradient, and have been determined to be naturally occurring in the area. Naturally occurring wastes are not addressed under Superfund.

INSTITUTIONAL CONTROLS: Institutional controls will be applied to prevent use of the underlying ground water due to the high concentration of naturally occurring metals in the ground water surrounding the site. These controls will include well construction permits and water quality certifications in accordance with State law.

KEYWORDS: Air Monitoring; Air Stripping; Arsenic; Benzene; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Closure; Clean Water Act; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

GLEN RIDGE RADIUM SITE, NJ

First Remedial Action
June 30, 1989

The Glen Ridge Radium site is in the Borough of Glen Ridge and the town of East Orange in Essex County, New Jersey. The site covers approximately 90 acres of residential neighborhoods including 306 properties. The Montclair/West Orange Radium site is adjacent to this site and is being addressed concurrently under one remedial action. The soil at the site is contaminated to varying degrees with radioactive waste materials suspected to have originated from radium processing or utilization facilities located nearby during the early 1900s. The waste material was disposed of in then-rural areas of the communities. Houses were subsequently constructed on or near the radium waste disposal areas. Some of the radium-contaminated soil is believed to have been used as fill in the low-lying areas, and some of the fill was mixed with cement for sidewalks and foundations. Temporary radon ventilation systems and gamma radiation shielding have been installed and maintained by EPA and the State to reduce indoor exposures. In June 1985 the State initiated a pilot study and excavated portions of the radium-contaminated soil and disposed of the soil offsite. The primary contaminant of concern affecting the soil and structures is radium^{226} which decays to radon gas.

The selected remedial action for this site includes excavation of approximately 41,000 cubic yards of highly contaminated soil and an unspecified amount of debris followed by offsite disposal;

installation and maintenance of indoor engineering controls at less contaminated properties; environmental monitoring to ensure remedy effectiveness; and continuation of a treatment technology study for future actions. A final decision for the less contaminated properties has been deferred until after the 60-day public comment period extension. The estimated present worth cost for this remedial action is $53,000,000 with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The radium^{226}-contaminated soil will be excavated to a concentration of 5 pCi/g above background concentration at the surface (top 6 inches) and 15 pCi/g above background in subsurface soil.

INSTITUTIONAL CONTROLS: A decision to implement municipal or county health ordinances (e.g., permits for home repair or outdoor activities, deed restrictions) was deferred as a result of public comment.

KEYWORDS: Air Monitoring; Background Levels; Carcinogenic Compounds; Debris; Deferred Decision; Direct Contact; Excavation; Filling; Institutional Controls; Interim Remedy; Offsite Disposal; Public Exposure; Radioactive Materials; Soil; Treatability Studies.

MARATHON BATTERY, NY

Third Remedial Action - Final
September 29, 1989

The Marathon Battery site is a former battery manufacturing plant in Cold Spring, Putnam County, New York. The site is composed of three study areas: Area I, which consists of East Foundry Cove Marsh and Constitution Marsh; Area II, which encompasses the former plant, presently a book storage warehouse, the surrounding grounds, and a vault with cadmium-contaminated sediment dredged from East Foundry Cove; and Area III, which includes East Foundry Cove (48 acres), West Foundry Cove and the Hudson River in the vicinity of Cold Spring pier and a sewer outfall. Contamination in Area III emanates from plant wastewater that was discharged via the city sewer system into the Hudson River at Cold Spring Pier or, in some instances, through a storm sewer into East Foundry Cove. A ROD was signed for Area I in September 1986 with cleanup activities to includes dredging the East Foundry Cove Marsh. The second ROD for this site was signed in September 1988 and included decontamination of the battery plant and soil excavation in Area II. This 1989 ROD represents the third and final operable unit for the site and addresses sediment contamination in Area III. The primary contaminants of concern affecting sediment at the site are metals including cadmium and nickel.

The selected remedial action for the site includes dredging of approximately 55,000 cubic yards of cadmium-contaminated sediment in East Foundry Cove to a depth of one foot, followed by onsite chemical fixation and offsite disposal; sampling and analysis of the area adjacent to and under Cold Spring pier and dredging approximately 900 cubic yards of cadmium-contaminated sediment from this area followed by treatment with East Foundry Cove sediment; sediment monitoring and performance of a hydrological study of Area III to determine if West Foundry Cove is a depositional area and in need of remediation; and long-term sediment monitoring. The estimated present worth cost for this selected remedy is $48,499,500, which includes annual O&M costs of $21,303,330 for the first year and $132,700 for years 2-30.

PERFORMANCE STANDARDS OR GOALS: The risk assessment for the site used references doses because neither of the contaminants of concern are considered carcinogenic. The acceptable sediment concentration of cadmium is 220 mg/kg. Expectations are that by dredging the upper layer of contaminated sediment, 95% of the cadmium contamination will be removed. It is anticipated that following remediation, cadmium concentrations in the dredged areas will not exceed 10 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Clean Water Act; Direct Contact; Dredging; Excavation; Metals; O&M; Offsite Disposal; Onsite Treatment; RCRA; Sediment; State Permit; State Standards/Regulations; Treatment Technology; Water Quality Criteria.

MONTCLAIR/WEST ORANGE RADIUM SITE, NJ

First Remedial Action
June 30, 1989

The Monclair/West Orange Radium site is located in the towns of Montclair and West Orange in Essex County, New Jersey. The site covers approximately 120 acres of residential neighborhoods. The Glen Ridge Radium site is adjacent to this site and is being addressed concurrently under one remedial action. The soil at the site is contaminated with radioactive waste materials suspected to have originated from radium processing or utilization facilities located nearby during the early 1900s. The waste material was disposed of in then-rural areas of the communities. Houses were subsequently constructed on or near the radium waste disposal areas. Some of the radium-contaminated soil is believed to have been used as fill in low-lying areas, and some of the fill was mixed with cement for sidewalks and foundations. Temporary radon ventilation systems and gamma radiation shielding have been installed and maintained by EPA and the State to reduce indoor exposures. In June 1985 the State initiated a pilot study, excavated portions of the radium-contaminated soil and disposed of the soil offsite. The primary contaminant of concern affecting the soil and structures is radium^{226} which decays to radon gas.

The selected remedial action for this site includes excavation of approximately 41,000 cubic yards of highly contaminated soil and an unspecified amount of debris followed by offsite disposal; installation and maintenance of indoor engineering controls at less contaminated properties; environmental monitoring to ensure remedy effectiveness; and continuation of a treatment technology study for future actions. EPA deferred a final decision for the less contaminated properties until after a 60-day public comment period extension. The estimated present worth cost for this remedial action is $53,000,000 with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The radium^{226}-contaminated soil will be excavated to a concentration of 5 pCi/g above background concentration at the surface (top 6 inches) and 15 pCi/g above background in subsurface soil.

INSTITUTIONAL CONTROLS: A decision to implement municipal or county health ordinances (e.g., permits for home repairs or outdoor activities, deed restrictions) was deferred as a result of public comment.

KEYWORDS: Air Monitoring; Background Levels; Carcinogenic Compounds; Debris; Deferred Decision; Direct Contact; Excavation; Filling; Institutional Controls; Offsite Disposal; Public Exposure; Radioactive Materials; Soil; Treatability Studies.

NORTH SEA MUNICIPAL LANDFILL, NY

First Remedial Action
September 29, 1989

The North Sea Municipal Landfill site is on eastern Long Island in Southampton, Suffolk County, New York. The site is south of Little Peconic Bay, in an area of extensive ponds, coves, and wetlands. The 131-acre active landfill overlies two aquifers and is adjacent to private homes that obtain their drinking water from private domestic wells. Two landfill cells, a proposed cell and a series of 14 lagoons are also on the site. Municipal solid waste, refuse, debris, and septic system waste from residential, industrial, and commercial sources have been disposed of at the site since 1963. From the early 1960s to 1985 Cell #1 received approximately 1.3 million cubic yards of municipal waste and septic sludges. Subsequent ground water monitoring revealed a contaminated plume migrating from cell #1 toward a nearby cove. Cell #1 was closed and partially capped in 1985, and a storm water diversion system was also installed to collect storm water and recharge it. Cell #2, which was equipped with a leachate collection system and accepted approximately 80,000 tons of municipal waste annually, has been closed since October 1989. The town has constructed Cell #3, which is now in operation. From the late 1960s to 1986, 14 lagoons were used to dispose of approximately 11 million gallons of septic waste. The lagoons were subsequently excavated and backfilled. This is the first of two planned operable units and addresses source control through remediation of Cell #1 and the former sludge lagoons. A subsequent ROD will address ground and surface water contamination. The primary contaminants of concern affecting the soil and sludge are VOCs; other organics including PAHs; metals including arsenic and lead; and other inorganics.

The selected remedial action for this site includes covering Cell #1 with a low permeability cap; implementing site security and deed restrictions; sampling sludge/soil in the former sludge lagoons; and long-term air, surface water and ground water quality monitoring. The estimated present worth cost for this remedial action ranges from $7,700,000 to $8,300,000, depending on the type of landfill cap selected. These figures include an estimated annual O&M cost ranging between $190,000 and $200,000.

PERFORMANCE STANDARDS OR GOALS: Capping of the landfill reduces emissions of methane gas and VOCs and reduces percolation of precipitation through the landfill and thus migration of hazardous substances into ground water. Individual contaminant goals were not specified for this source control remedial action.

INSTITUTIONAL CONTROLS: Site security and deed restrictions will be implemented.

KEYWORDS: Air Monitoring; Arsenic; Capping; Carcinogenic Compounds; Direct Contact; Ground Water Monitoring; Inorganics; Institutional Controls; Leachability Tests; Lead; Metals; Municipally Owned Site; O&M; Organics; PAHs; Sludge; Soil; State Standards/Regulations; Surface Water Monitoring; VOCs.

PEPE FIELD, NJ
First Remedial Action - Final
September 29, 1989

The Pepe Field site is a former disposal area in the town of Boonton, Morris County, New Jersey. The 3-acre site is an inactive, municipally owned recreational facility in a predominantly residential area. From 1935 to 1950 the E.F. Drew Company used the site to dispose of wastes generated from processing vegetable oils and soap products. Materials reportedly deposited onsite by the E.F. Drew Company were diatomaceous earth and activated carbon filter residue, incinerator and boiler ash, lime sludge, and soap residue. Residents living adjacent to the site complained about objectionable odors originating from the site. To reduce odor emissions, the town implemented elements of the odor abatement program proposed by the Drew Company. During the 1960s, the town covered the site with soil and installed a leachate collection and treatment system. Although these measures reduced the the odor problems, some incidents were still reported. Investigations revealed gas concentrations exceeding the lower explosive limit in the soil vapor at the perimeter of the site and in an apparent soil gas plume extending below the property adjacent to the site. The primary contaminants of concern affecting the soil found in the landfill include hydrogen sulfide and methane gases.

The selected remedial action for this site includes maintaining the site cover; installing and maintaining a landfill gas collection and treatment system using carbon adsorption; disposing of carbon offsite; upgrading and maintaining the existing leachate collection and treatment system; ground water monitoring; and implementing deed restrictions to prevent waste disruption. The estimated present worth cost for this remedial action is $1,293,700, which includes an estimated O&M cost of $108,000 for the first two years and $93,000 for the next 28 years.

PERFORMANCE STANDARDS OR GOALS: Ground water and soil already meet State drinking water standards and State action levels. Leachate quality will comply with State requirements for discharge either to a publicly owned treatment works or to a nearby river. Emissions from the gas treatment system will comply with State air pollution regulations. Chemical-specific cleanup goals were not specified.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent waste disruption.

KEYWORDS: Carbon Adsorption; Closure Requirements; Direct Contact; Ground Water Monitoring; Institutional Controls; Leachate Collection/Treatment; Municipally Owned Site; Offsite Disposal; O&M; Onsite Containment;

Onsite Treatment; Soil; State Soil Standards/Regulations; Treatment Technology; Vacuum Extraction.

PICATINNY ARSENAL, NJ
First Remedial Action
September 28, 1989

The Picatinny Arsenal site is a munitions and weapons research and development installation covering 6,491 acres and containing 1,500 buildings in Morris County, near the city of Dover, New Jersey. Ground water contamination above State and Federal action levels has been detected in the vicinity of Building 24, where past wastewater treatment practices resulted in the infiltration of metal plating waste constituents (i.e., VOCs and heavy metals) into the ground water. Two unlined lagoons alongside Building 24, thought to be a source of contamination, was eliminated during a 1981 action during which the unlined lagoons were demolished, contaminated soil removed, and two concrete lagoons installed. Two additional potential sources of contamination are a dry well at Building 24 and a former drum storage area at Building 31, directly across the street from Building 24. This interim ground water cleanup remedy is designed to prevent deterioration to Green Pond Brook, a major drainage artery onsite, while the arsenal, as a whole is evaluated. The primary contaminants of concern affecting the ground water are VOCs including TCE, and metals.

The selected interim remedy for this site includes ground water pumping and treatment using a pretreatment system for the removal of metals and solids and air stripping to remove VOCs; GAC filtration of VOCs from the air stripper exhaust and air stripper effluent; discharge of treated ground water to Green Pond Brook; and effluent and air monitoring. The estimated capital cost for this remedial action is $2,100,000 with annual O&M costs of $1,100,000.

PERFORMANCE STANDARDS OR GOALS: ARARs will be used to establish effluent quality and allowable VOCs emissions; however, ARARs for ground water cleanup will apply to the final remedial action, not this interim action. Chemical-specific cleanup levels, therefore, were not established.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARAR Waiver; Carbon Adsorption (GAC); Clean Air Act; Clean Water Act; Ground Water; Ground Water Treatment; Interim Remedy; Leachability Tests; Metals; O&M; Onsite Discharge; Onsite Treatment; Plume Management; RCRA; State Standards/Regulations; TCE; VOCs.

PORT WASHINGTON LANDFILL, NY
First Remedial Action
September 30, 1989

The Port Washington Landfill site is on the eastern portion of Manhasset Neck, Nassau County, Long Island, New York. The 139-acre municipally owned site consists of two landfilled areas separated by a vacant area. This ROD addresses the 53-acre inactive landfill on the western portion of the site, which is the suspected source of methane gas thought to cause furnace explosions in residences neighboring the landfill during 1979 through 1981. From 1974 to 1983 the landfill operator accepted incinerator residue, residential and commercial refuse, and construction rubble for disposal. Because extensive air monitoring, performed in 1981, revealed high methane levels in several area residences, a venting system was installed to prevent subsurface gases from migrating west of the landfill and to destroy hazardous chemicals commonly detected in sanitary landfill gas. In 1981 the county also determined the presence of VOC contaminants in a drinking water well onsite, which has since been removed from service. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and benzene; and other organics including methane gas.

The selected remedial action for this site includes capping the landfill; rehabilitating the existing gas collection system and installing additional vacuum extraction vents; ground water pumping and treatment using a metals removal process and air stripping followed by discharge to an aquifer recharge basin; and environmental monitoring using ground water and landfill gas wells. The estimated present worth cost for this remedial action is $42,580,000, which includes a present worth O&M cost of $16,247,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals are based on SDWA MCLs and State standards for drinking water. Chemical-specific goals were not provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Landfill Closure; Leachability Tests; MCLs; Municipally Owned Site; O&M; Onsite Discharge; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; Venting; VOCs.

PREFERRED PLATING, NY
First Remedial Action
September 22, 1989

The 0.5-acre Preferred Plating site is in a light industrial area of Farmingdale, Suffolk County, New York. The site is bordered to the east and west by commercial and light industrial properties, to the north by a large wooded area, and to the south by a residential community and a U.S. Army facility. More than 10,000 people live within a 3-mile radius of the site. Between September 1951 and June 1976, Preferred Plating Corporation operated a metal treating facility that resulted in the generation, storage, and disposal of hazardous waste. Untreated wastewater was discharged to four concrete leaching points directly behind the facility. Site investigations conducted by the county as early as 1953 revealed heavy metal contamination of ground water and cracked and leaking onsite leaching pits. Ground water is used for drinking water supplies by the entire population of both Nassau and Suffolk counties. The nearest public water supply well fields are located approximately one mile southeast of the site. This operable unit addresses the overall ground water contamination attributable to the site; a second operable unit will be undertaken to more fully characterize and identify any contaminated soil and to investigate potential upgradient sources of contamination. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE, and metals including chromium and lead.

The selected remedial action for this site includes pumping and onsite treatment of contaminated ground water using metal precipitation, carbon adsorption, and ion exchange followed by reinjection of the treated ground water; offsite disposal of 220 gallons per day of wet cake generated by the water treatment plant and spent carbon filters to a RCRA subtitle C facility; and periodic ground water monitoring. The estimated present worth cost is $9,327,400 for 12 years with an annual O&M cost of $920,900.

PERFORMANCE STANDARDS OR GOALS: Onsite ground water cleanup standards for the contaminants of concern were based on SDWA MCLs and State Ground Water Quality Regulations. Because this ROD is only part of a total remedial action that will include another operable unit, the selected remedy by itself will not meet all chemical-specific ARARs or be capable of restoring area ground water to ground water quality standards until upgradient source areas are removed. In the event a second operable unit fails to identify or control the source area, a waiver for technical impracticability will be sought.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carbon Adsorption; Carcinogenic Compounds; Chromium; Clean Water Act; Contingency Remedy; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria.

SMS INSTRUMENTS (DEER PARK), NY
First Remedial Action
September 29, 1989

The 1.5-acre SMS Instruments site is in a light industrial and residential area of Deer Park, Suffolk County, New York. Since 1967 the site has been operated as an industrial facility which overhauls military aircraft components. Past waste disposal practices included discharging untreated wastewater from degreasing and other refurbishing operations to an underground leaching pool. In 1980 the site owner removed 800 gallons of VOC- and metal-contaminated wastewater from the pool, and subsequently filled it with sand and sealed all drain pipes. In 1981 the county required the site owner to leak test a 6,000 gallon underground storage tank (UST) used to store jet fuel. Because tests indicated leakage, the tank was emptied and, in 1988, was excavated and removed. This ROD represents the first of two operable units at the site and addresses ground water and soil contamination. Source areas include the former UST area, the leaching pool, and spill areas where wastes were formerly stored in drums. A subsequent operable unit will investigate suspected sources of upgradient contamination. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and xylenes; and metals including chromium and lead.

The selected remedial action for this site includes treating approximately 1,250 cubic yards of soil using in-situ steam stripping or air stripping depending on the results of a planned treatability study; and ground water pumping and treatment using air stripping followed by reinjection through onsite wells. The contingency plan for soil remediation includes excavation and offsite incineration of contaminated soil. The estimated present worth cost for the selected remedial action is $1,195,800, which includes an annual present worth O&M cost of $437,576.

PERFORMANCE STANDARDS OR GOALS: Treated ground water will meet State and Federal drinking water standards prior to reinjection. Specific ground water cleanup goals include TCE 5 ug/l (MCL), PCE 0.7 ug/l (State); xylenes 5 ug/l (State), chromium 50 ug/l (MCL), and lead 25 ug/l (State). Soil will be treated until all VOC contaminants of concern attain a soil contaminant level of less than 10 ug/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Chromium; Contingent Remedy; Decontamination; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Treatment; Lead; MCLs; Metals; Offsite Disposal; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; Sole-Source Aquifer; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

VINELAND CHEMICAL, NJ
First Remedial Action
September 28, 1989

The Vineland Chemical site is in Vineland, Cumberland County, New Jersey. The site is in a residential/industrial area and borders the Blackwater Branch stream a tributary to the Maurice River, which ultimately flows into Union Lake. The Vineland facility consists of several herbicide manufacturing and storage facilities, a wastewater treatment facility, and several lagoons. The facility produces approximately 1,107 tons of herbicide waste by-product salts, EPA hazardous waste number K 031, each year which were stored onsite in uncontrolled piles on the soil, in the unlined lagoons, and in abandoned chicken coops. Furthermore, arsenic-contaminated wastewater was discharged into unlined lagoons until 1980 when Vineland Chemical Company began treating wastewater. Since 1978 hazardous waste salts produced at the site have no longer been stored onsite for more than 90 days and are disposed of offsite by licensed shippers; however, the past improper storage of those salts have resulted in extensive arsenic contamination of soil, sediment, and ground water because of the high solubility of the salts. The ground water underneath the plant discharges into the Blackwater Branch stream and has resulted in contamination of sediment in Blackwater Branch, the Maurice River, and Union Lake. The site has been divided into four discrete operable units to facilitate remediation: sediment in the 870-acre

Union Lake; sediment in the Maurice River and Blackwater Branch stream areas; soil associated with the Vineland Chemical Company facility; and ground water underlying the site. The primary contaminant of concern affecting the soil, sediment, and ground water is arsenic.

The selected remedial actions for this site will be implemented in four discrete operable units (OUs). OU 1, the plant site source control, will include in-situ flushing of 126,000 cubic yards of arsenic-contaminated soil, 54,000 cubic yards of which will be excavated and consolidated with 72,000 cubic yards of undisturbed soil; decontaminating onsite storage buildings (chicken coops); and closing two impoundments followed by offsite treatment and disposal of the wastewater and sludge recovered from the impoundments. OU 2, the plant site ground water, will include ground water pumping and treatment followed either by reinjection, offsite discharge to the Maurice River, or reuse for soil flushing; and offsite treatment and disposal of residue sludge from ground water treatment. OU 3, the stream and river areas sediment, will include excavating, dredging, and treating 62,600 cubic yards of exposed and buried sediment from the Blackwater Branch and its floodplain using water wash extraction followed by onsite redeposition of treated sediment; treating and offsite disposal of sludge residue from the water wash extraction process; implementing a three-year period of natural river flushing for the Maurice River sediment after remediating the arsenic-contaminated ground water; and selection of a water wash contingent remedy for the river sediments if levels persist above action levels. OU 4, an interim remedy for the Union Lake sediment, will include dredging, excavating, and treating sediment from Union Lake using water wash extraction followed by redeposition into the lake; treating and disposing of sludge residue offsite; and sediment and surface water monitoring. The estimated present worth cost for these remedial actions is $66,384,636, which includes estimated annual O&M costs of $3,463,463 for the short term and $38,010 for the long term for the plant source control, stream and river sediment, and lake sediment operable units; and a present worth O&M cost of $5,155,053 for the ground water operable unit.

PERFORMANCE STANDARDS OR GOALS: Soil, sediment, and ground water cleanup goals for arsenic are based on 10^{-6} health-based levels and MCLs. Specific goals include 20 mg/kg (soil and surface sediment), 120 mg/kg (submerged sediment), and 50 ug/l (ground water).

INSTITUTIONAL CONTROLS: Not applicable (may be determined and implemented at a later date).

KEYWORDS: ACL; Arsenic; Closure Requirements; Decontamination; Direct Contact; Dredging; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Leachability Tests; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; Soil Washing/Flushing; State Standards/Regulations; Surface Water Monitoring; Treatability Studies; Treatment Technology; Wetlands.

VINELAND STATE SCHOOL, NJ

First Remedial Action - Final
September 30, 1989

The 195-acre Vineland State School site is in the northern part of the city of Vineland, Cumberland County, New Jersey. The site, commonly referred to as the Vineland Developmental Center, is a residential treatment facility for mentally handicapped women and is comprised of numerous buildings to care for the 1,300 residents. In addition to the facility, the site includes farmland, a hospital care facility, facility maintenance shops, and an unregulated incinerator. The site overlies three aquifers which serve as major sources of drinking water for the county. There were numerous allegations of improper waste disposal at five separate onsite subsites. Subsite 1, a former landfill which has since been covered and vegetated, reportedly had been used to dump mercury- and arsenic-contaminated pesticides. Data from the remedial investigation, however, could not confirm these allegations. At subsite 2, PCB-contaminated fluid spilled and spread over a 1-acre area. The State remediated subsite 2 in 1988, which included demolishing and disposing of approximately 3,900 tons of PCB-contaminated soil and concrete pads offsite. Subsite 3 was a garbage dump for 10 years before being backfilled and used as a baseball field. Subsites 4 and 5 were pits where transformer oils and chemicals were dumped in the mid 1950s. Investigation results of the subsites excluding subsite 2, which was cleaned up in 1988, revealed only low levels of contamination.

The selected remedial action for this site is no further action. The risks posed by the contamination in these areas are within the acceptable range as determined by the State and EPA. As a precautionary measure, however, ground water and disposal areas will be monitored. No costs were specified for this remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy.

RECORDS OF DECISION ABSTRACTS
REGION III
(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia)

AMBLER ASBESTOS PILES, PA
Second Remedial Action - Final
September 29, 1989

The Ambler Asbestos Piles site is in the southwestern portion of the Borough of Ambler, Montgomery County, Pennsylvania. This second operable unit for the site addresses the CertainTeed asbestos pile portion of the Ambler Asbestos site. The CertainTeed asbestos pile contains asbestos scrap materials and encompasses approximately 3.5 acres of a 5-acre tract. Land around the site is used for industrial, commercial, residential, and transportation purposes. The site is bordered to the southeast by the Stuart Farm Creek floodplain and associated wetlands system, and to the west by the Wissahickon Creek floodplain. The CertainTeed pile was created by the disposal of asbestos-cement scrap originating from asbestos pipe manufacturing operations at the CertainTeed plant. In addition, asbestos-contaminated sludge from a process water treatment settling pond was also disposed of at the site. Asbestos waste disposal continued from 1962 until 1977 when the State ordered the CertainTeed pile closed. At present the pile contains approximately 110,000 cubic yards of asbestos-related waste material which is covered by approximately 22,000 cubic yards of soil. Several inorganic contaminants have also been detected in the soil and debris of the pile as well as in surface water and sediment from Stuart Farm Creek. Because the actual sources of the inorganic contaminants in the creek have not been identified, a verification study will be performed to define the source of these contaminants. The primary contaminant of concern affecting the soil, sediment, debris, and surface water is asbestos.

The selected remedial action for the site includes regrading the pile plateau to promote proper storm water drainage; placing a soil cover with geotextile reinforcement on portions of the pile plateau and slope where the soil cover is less than two feet deep; performing a verification study to determine the source of inorganics in Stuart Farm Creek; installing erosion control devices to protect the toe of the pile from scouring by Stuart Farm Creek; implementing erosion and sedimentation controls to facilitate vegetation; restricting site access; monitoring air and surface water; and post-closure maintenance. The estimated present worth cost for this remedial action is $753,000, which includes annual O&M costs of $21,700 for the first 5 years and $10,200 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: This remedy addresses containment of asbestos-contaminated debris; therefore, no cleanup level is provided for the debris.

INSTITUTIONAL CONTROLS: Institutional controls will be established to restrict future land use to surficial activities by authorized personnel.

KEYWORDS: Air; Air Monitoring; ARAR Waiver; Asbestos; Capping; Clean Air Act; Debris; Floodplain; Institutional Controls; O&M; Sediment; Soil; State Permit; State Standards/Regulations; Surface Water; Surface Water Monitoring; Toxic Substances Control Act; Wetlands.

BALLY GROUND WATER CONTAMINATION, PA
First Remedial Action
June 30, 1989

The Bally Ground Water Contamination site is a municipal water supply well field in the Borough of Bally in Berks County, near the Philadelphia metropolitan area. The Bally Well Field and the springs to the northwest of the site are the public water sources for approximately 1,200 Bally residents. The area near the site includes wetlands to the north and a manufacturing plant (the plant) 1,000 feet to the south of one of Bally Well Field's municipal wells (Well No. 3). Since the 1930s degreasing solvents containing methylene chloride, TCA, methanol, toluene, and TCE have been used in manufacturing at the plant. One of the plant's facilities includes a drum storage area which contains empty drums, waste oil, and spent degreasers. A 1982 State water quality check identified the plant as a source of VOC contamination in Bally's municipal wells. Former lagoons underlie the plant and are also considered potential sources of aquifer contamination. From December 1982 to March 1987 the Borough of Bally did not use the contaminated Municipal Well No. 3 for water supply although the water was periodically pumped and discharged into a nearby pond to contain the contaminant plume. Pumping, however, had the effect of drawing VOCs deeper into the aquifer. The well was completely shut down in March 1987. Results of additional ground water contamination studies indicated that 19 of 35 wells sampled, contained detectable levels of VOCs. Currently a plume of VOC-contaminated ground water extends from the plant to the east and northeast. Plume contaminant movement has become more controlled since pumping and air stripping pilot testing began at Well No. 3. Ground water is the focus of this remediation because no remaining source of VOC contamination has been identified on the site. The primary contaminants of concern affecting the ground water are VOCs including TCE.

The selected remedial action for this site includes abandoning appropriate wells in the attainment area; pumping and treatment of ground water from Municipal Well No. 3 by air stripping with either vapor phase carbon, regenerable vapor phase carbon, or vapor phase catalytic oxidation, followed by discharging treated water to an adjacent stream or into the municipal potable water system, as needed, to provide a suitable alternative water supply; implementation of institutional controls restricting the use of operable private wells and the construction of new wells within the attainment area; and performing ground water and surface water monitoring to measure contaminant concentration and migration. The estimated present worth cost for this remedial action ranges from $2,950,000 to $3,640,000, which includes O&M costs from $105,000 to $189,000 depending on the chosen treatment option.

PERFORMANCE STANDARDS OR GOALS: Ground water will be treated to meet MCLs or PMCLS when final MCLs are unavailable. Chemical-specific goals include TCE 0.005 mg/l (MCL).

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict the use of operable private wells and the construction of new wells.

KEYWORDS: Air Stripping; Alternate Water Supply; Clean Air Act; Clean Water Act; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; MCLs; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Public Exposure; Safe Drinking Water Act; Sole-Source Aquifer; Solvents; State Standards/Regulations; State Permit; Surface Water Monitoring; TCE; Treatability Studies; VOCs; Water Quality Criteria; Wetlands.

CRAIG FARM DRUM, PA
First Remedial Action - Final
September 29, 1989

The Craig Farm Drum site covers approximately 117 acres near the village of Fredericksburg in Armstrong County, Pennsylvania. The area around the site is dominated by farmland and forest, and a creek crosses the southern portion of the site. The site consists of two abandoned strip mine pits which were later used for disposal of distillation residue containing resorcinol and other high polymers. From 1958 to 1963 the Koppers Chemical Co. disposed of 2,500 tons of resorcinol production residue in 55-gallon drums in the pits. Resorcinol is an organic compound used as an adhesive enhancer in commercial products such as tires and pharmaceuticals. Investigations in 1984 revealed that the majority of drums were broken or crushed and were without lids. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene; other organics including phenols; metals including lead and chromium; and other inorganics.

The selected remedial action for this site includes excavation of 32,000 cubic yards of soil from the two disposal pits and surrounding area with onsite solidification; placement of treated soil in a newly excavated and lined onsite landfill followed by capping; passive collection of ground water using a seep interceptor system with offsite treatment; and performance of a ground water verification study. The estimated present worth cost for this remedial action is $5,188,000, which includes estimated annual O&M costs of $124,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil will be excavated until the organic compound resorcinol is no longer detectable (<50 mg/kg). Ground water performance levels include benzene 0.005 mg/l (MCL), phenol 3.5 mg/l (AWQC), chromium 0.05 mg/l (MCL), and lead 0.05 mg/l (MCL).

INSTITUTIONAL CONTROLS: Deed notices will be implemented to notify property owners of contaminants at the site.

KEYWORDS: Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Inorganics; Institutional Controls; Lead; Metals, MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs; Wetlands.

CROYDON TCE, PA
First Remedial Action
December 28, 1988

The Croydon TCE site is located in Bristol Township, Bucks County, Pennsylvania. VOC contamination in the ground water has been detected over a 3.5-square mile area referred to as the study area. The study area is predominantly residential with an estimated 3,000 residents. A small southeastern portion of the study area containing elevated levels of VOCs, particularly TCE, and numerous potential source areas have been identified and are referred to collectively as the "focused area of investigation." This smaller area is composed of the Croyden residential community and several manufacturing and commercial establishments. The study area is bordered on the south by the Delaware River. Neshaminy Creek, which borders the study area to the west, and Hog Run Creek which flows through the focused area of investigation, both discharge to the river. Although the source of contamination has not been identified, the contaminant plume appears to be flowing south-southeast into the East Branch of Hog Run Creek and probably into the Delaware River. EPA identified the Croyden site following a series of studies beginning in 1984 conducted on the Rohm & Haas site, an industrial landfill, located on the southern boundary of the site. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE.

The selected remedial action for this site includes connecting approximately 13 residences to the public water supply system via the construction of new water services lines, mains, hydrants, and valves; and ground water monitoring to ensure that homes located outside of the TCE-contaminated zone will not be at risk from the migrating plume. The estimated present worth cost for this remedial action is $106,000 with annual O&M cost of $3,400 for 30 years.

PERFORMANCE STANDARDS OR GOALS: This operable unit does not address treatment of contaminated soil or water. The remedy will prevent human exposure to concentrations of TCE in excess of Federal, State and local health-based ARARs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Interim Remedy; O&M; PCE; TCE; VOCs.

CRYOCHEM, PA

First Remedial Action
September 29, 1989

The 19-acre CryoChem site is a metal fabricating facility in the village of Worman, Earl Township, Berks County, Pennsylvania. The facility consists of a workshop area, a warehouse, and an office building which are all located in the southern four acres of the site. Between 1970 and 1982, Cryochem reportedly used chemical solvents to clean dye from metal welds at a rate of two to three 55-gallon drums per year. The facility also reported that a solvent spill had occurred at some unspecified time in the past. Spilled solvent is suspected to have collected in the workshop drains and flowed, through underground channels, towards a stream that flows across the site. Spilled solvent has also migrated through the soil column and has contaminated the ground water underlying the site. Ground water samples, collected between 1981 and 1985 by the State and EPA, revealed that an onsite production well, nearby residential wells, and onsite soil have been contaminated. As a result of drinking water contamination, EPA installed activated carbon filters in 13 homes in 1987. This ROD, the first of two operable units, addresses the distribution of clean water to residents whose water supply is affected or potentially affected by ground water contamination. The primary contaminants of concern affecting the ground water are VOCs including TCA, DCA, TCE, DCE, and PCE.

The selected remedial action for this first operable unit includes installation of dual-activated carbon adsorption units or continued maintenance of existing carbon units at affected homes until a permanent clean water supply is developed; implementation of periodic sampling at potentially affected homes; construction of a new uncontaminated water supply to serve affected and potentially affected residences and businesses; and periodic sampling of residents outside the affected area. The estimated present worth cost for this remedial action is $1,260,000 which includes annual O&M costs of $80,000.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet SDWA MCLs or an excess cancer-risk level less than 10^{-6} if an MCL has not been developed for a particular chemical. Target cleanup levels for ground water include TCA 200 ug/l (MCL), DCA 0.38 ug/l (based on a 10^{-6} cancer risk), TCE 5 ug/l (MCL), DCE 7 ug/l (MCL), and PCE 0.66 ug/l (based on a 10^{-6} cancer risk).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; Carbon Adsorption (GAC); Carcinogenic Compounds; Drinking Water Contaminants; MCLs; O&M; PCE; Safe Drinking Water Act; TCE; VOCs.

DOUGLASSVILLE DISPOSAL, PA

Second Remedial Action - Final
June 30, 1989

The Douglassville Disposal site is a 50-acre abandoned waste oil processing facility in Union Township, Berks County, Pennsylvania. The area surrounding the site includes agricultural land, residences, and light industrial development. The site lies almost entirely within the 100-year floodplain of the Schuylkill River, which borders the site to the north and east. The Schuylkill River is used for municipal and industrial water supply, recreational purposes, and waste assimilation. Further downstream of the site, seven public water supply users draw water from the Schuylkill River. From 1941 to 1979 the site operated as a lubrication oil and waste solvent recycling facility. Wastes generated from the recycling processes were stored onsite in several lagoons. The site consists of a former waste oil processing area and various waste disposal areas. Because of the site's size and the complexity of the various onsite activities, the site has been divided into 10 source areas of contamination. Disposal areas include two backfilled sludge disposal lagoons (source areas 4 and 5), an oily filter cake disposal area (source area 2), an oil drum storage area (source area 8), an area where waste oil sludge was landfarmed into the soil (source areas 3 and 6), the former processing facility/tank farm area (source area 1), a small backfilled lagoon (source area 9), an old incinerator (source area 7), and an area of scrap metal and tanks (source area 10). In 1970 heavy rain caused a lagoon to overflow and breach safety dikes; two to seven million gallons of waste flowed into the Schuylkill River. Two years later, a hurricane caused the Schuylkill River to overflow its banks and inundate the entire site, releasing an estimated six to eight million gallons of waste. EPA subsequently drained and backfilled the lagoons. Beginning in 1979 operations changed to refining waste oils for use as fuel in industrial boilers. Oily wastewater sludge from the refining process was landfarmed in the area until 1981, when the State mandated operational corrections to the landfarming practices. All operations ceased in 1985. The 1988 ROD addressed the risks associated with the former processing facility/tank farm area, which were impediments to any future soil and ground water remediation. This second and final response action addresses soil and ground water contamination remaining after the former processing facility/tank farm and associated wastes have been removed offsite. This ROD also amends, in part, the 1985 ROD, which outlined the remedial action for the source areas designated as 2, 4, and 5 but which deferred a decision regarding ground water contamination. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, toluene, and vinyl chloride; other organics including PAHs, PCBs, and phenol; and metals including lead.

The selected remedial action for this site includes excavation and onsite thermal treatment of 48,400 cubic yards of soil and sludge from source area 2, and 600 cubic yards of oily sediment from the drainage ditch that runs from source area 9, followed by backfilling ash residue into source area 2; covering the backfilled area with clean soil followed by revegetation; capping of source areas 1, 4, and 5 with one foot of fly ash and two feet of soil followed by revegetation; if ash residues exceed EP toxicity levels, solidification would be required prior to onsite disposal; capping source areas 3, 6, and 9 (approximately 10 acres) with one foot of clean soil followed by revegetation; implementing institutional controls to prevent soil disturbance and well drilling; ground water and surface water monitoring; and establishing ACLs for ground water. The estimated present worth cost for this remedial action ranges from $39,430,000 to $53,769,000 depending on whether ash residue requires solidification prior to disposal.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will treat soil that exceeds a 10^{-6} cancer-risk level. Ground water protection standards will be ACLs and will be established as the maximum existing concentration measured in the monitoring wells. The ACLs include benzene 2,000 ug/l, toluene 2,300 ug/l, vinyl chloride 1,200 ug/l, phenol 7.1 ug/l, and lead 227 ug/l. Lead emissions to the air will not exceed National Ambient Air Quality Standards (NAAQS) and State air quality standards which are set for lead at 1.5 ug/m^3 (on a quarterly average).

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict area access and ground water use.

KEYWORDS: ACL; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Closure Requirements; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Lead; Metals; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Phenols; RCRA; ROD Amendment; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water Monitoring; Toluene; Toxic Substances Control Act; Treatability Studies; VOCs; Wetlands.

HAVERTOWN PCP, PA

First Remedial Action
September 29, 1989

The Havertown PCP site is in Havertown, Delaware County, Pennsylvania, approximately 10 miles west of Philadelphia. This 12- to 15-acre site consists of a wood treatment facility, an adjacent manufacturing facility, and Naylors Run Creek which drains the area. Land use in the vicinity of the site consists of commercial and residential properties. Contamination at the site is due to improper disposal of wastes generated from wood preserving operations. From 1947 to 1963 PCP-contaminated oil was dumped into a well which drained into ground water beneath the facility. In 1972 the State identified contaminated ground water discharging from a storm sewer into Naylors Run. From 1976 to 1982 EPA performed containment activities including installing filter fences in Naylors Run and sealing a sanitary sewer pipe. In 1988 EPA installed a catch basin in Naylors Run to trap discharge from the storm sewer pipe. Other onsite wastes include five holding tanks filled with PCP- and VOC-contaminated wastewater and numerous 55-gallon drums of unanalyzed waste materials. This ROD, the first of two operable units, will address the remediation of surface water and the disposal of drummed and tanked wastes. A subsequent ROD will address the impact of contaminated soil on ground water contamination at the site. The primary contaminants of concern affecting the surface water are VOCs including benzene, toluene, and TCE; other organics including phenols, dioxins, PCP, and PAHs; metals including arsenic and chromium; and oils.

The selected remedial action for this site includes offsite land disposal of 200 drums of soil and oily debris, and offsite treatment and disposal of 6,000 gallons of wastewater stored in onsite tanks; soil monitoring; installing and operating an oil/water separator at the storm sewer effluent point to Naylors Run; multimedia monitoring; and implementation of site access restrictions. The estimated present worth cost for this remedial action is $1,158,200, which includes an estimated annual O&M cost of $110,000 for years 1-5 and $45,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals for the site are based on a 10^{-6} risk level. Specific surface water cleanup goals include reducing the discharge of PCP-contaminated oil to Naylors Run to less than 5 mg/l which translates to a surface water concentration of 17 ug/l. In addition, surface water concentrations for benzene, toluene, TCE and other VOCs will be reduced by 17%.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; ARAR Waiver; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Closure; Clean Water Act; Debris; Dioxin; Direct Contact; Floodplain; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; RCRA; State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; Monitoring; TCE; Toluene; VOCs.

HEBELKA AUTO SALVAGE YARD, PA
First Remedial Action
March 31, 1989

The 20-acre Hebelka Auto Salvage Yard site is in a rural area of the Weisenburg Township in Lehigh County, Pennsylvania. The site is bordered primarily by agricultural fields; however, three residences are located on or immediately adjacent to the site. From 1958 to 1979, the property was used as an automobile junkyard with intermittent periods of activity involving salvage operations. Debris including two large piles of battery casings, empty drums, junk cars, and scrap metal were accumulated onsite. A site inspection in December 1985 revealed lead in soil downgradient from the battery piles, and chromium in downgradient sediment. Lead concentrations were highest in surface soil samples (<3ft) ranging from 200-65,000 mg/kg. This ROD addresses source control; a second operable unit will address migration pathways such as downgradient sediment and ground water. The primary contaminant of concern at the site is lead.

The selected remedial action for this site includes excavation and onsite fixation of 5,000 cubic yards of soil, followed by offsite disposal of treated soil at a sanitary landfill; excavation and recycling of 1,000 cubic yards of battery casings; and soil backfilling and revegetation. The estimated present worth cost for this remedial action ranges from $6,073,436 to $6,884,652; the greater cost reflects the additional expense of disposing of the battery casings if recycling is impractical. No O&M costs are expected.

PERFORMANCE STANDARDS OR GOALS: The soil will be excavated down to a lead concentration of 560 mg/kg based on health-risk calculations.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Debris; Excavation; Leachability Tests; Lead; Metals; Offsite Disposal; Onsite Treatment; Soil; Solidification/Stabilization.

HENDERSON ROAD, PA
Second Remedial Action - Final
September 29, 1989

The Henderson Road site is a 7.6-acre site in Upper Merion Township, Pennsylvania. The site was used for waste storage, waste recycling, vehicle maintenance, and parking and office facilities between 1974 and 1989. The area surrounding the site is zoned for industrial and residential use. The site is bounded by the Pennsylvania Turnpike, the Conrail property including train tracks, Henderson Road, and Frog Run. The Upper Merion Reservoir, located 2,000 feet downgradient of the site, serves as part of the water source for approximately 228,000 people. Prior to 1974 the site was operated by the Ellis Concrete Company as a concrete preparation plant. In 1974, William J. O'Hara, Inc. began landfilling trash and construction debris on central and eastern portions of the site until 1984. Between 1974 and 1977, William J. O'Hara, Inc. allegedly injected industrial waste into a 160-foot onsite well. Furthermore, liquid waste, sludge, and drums may have been disposed of in the landfill. The first operable unit for this site, as described in a June 1988 ROD, included pumping and treatment, using air strippers, of contaminated ground water. This will be accompanied by additional characterization of the injection well, excavation of oil pit sediment if found, removal of significant waste within the well if feasible, institutional controls, further characterization of saturated and unsaturated zones, possibly direct treatment in the unsaturated zone, monitoring, and periodic evaluation of cleanup goals. The second operable unit addresses all surface sources of contamination at the site. The primary contaminants of concern affecting the injection well operable unit are VOCs including benzene, toluene, PCE, and TCE; and other organics including PAHs. Most of the chemicals of concern for the injection well operable unit are organics. The risk assessment for the landfill operable unit (LOU) was based on the prediction of movement of leachate to ground water. Of the 19 chemicals of concern identified for the LOU, bis (2-chloroethyl) ether and six volatiles are considered by EPA to pose the greatest threat to ground water. Other potential routes of exposure include those from ingestion of soil and inhalation of fugitive emissions.

The selected remedial action for this operable unit includes installation of erosion controls; regrading and capping, including possibly moving the onsite water main; installing a short- and long-term leachate collection system with treatment and discharge to be determined during design; excavation and movement of trash, soil, and cinder currently located at the adjacent Turnpike property, with appropriate remediation of wastes left in place at the Turnpike property; further sample collection and data evaluation in the western portion of the site leading to a determination regarding treatment and/or capping in that area, and contingent ground water recovery; monitoring of ground water and leachate; and institutional controls. The estimated present worth cost for this remedial action is $7,265,000, which includes an annual O&M cost of $213,260.

PERFORMANCE STANDARDS OR GOALS: Treatment prescribed for this LOU is designed to achieve an onsite risk of 4.2 x 10^{-6}. Soil cleanup is based on depth from surface not on concentrations of contaminants. Cleanup standards for the aquifer, which has been considered as Class IIA, are identified consistently for both operable units and are based on the most conservative value derived from the following: MCLs, MCLGs, aquatic water quality criteria, drinking water equivalent levels, suggested no-adverse effect levels, models developed during the risk assessment, processes described in the Superfund Public Health Evaluation Manual, and specific values developed by EPA where no other ARARs exist. MCLs were used where available. ACLs are proposed for 1,1-dichloroethane, 1,2-dichloroethane, benzene, 1,2-dichloropropane, and trichloroethene. Chemical-specific ARARs are proposed in the LOU ROD for 56 constituents.

INSTITUTIONAL CONTROLS: Institutional controls will be used to restrict activities that would interfere with remediation at the site.

KEYWORDS: Alternate Concentration Limits (ACL); Benzene; Capping; Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Institutional Controls; Leachate

Collection/Treatment; MCLs; MCLGs; O&M; Onsite Containment; Onsite Disposal; Organics; PAHs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; Solvents; Surface Water Collection/Diversion; TCE; Toluene; VOCs.

KIMBERTON SITE, PA

Second Remedial Action - Final

June 30, 1989

The Kimberton site is in Chester County, Pennsylvania, near the Philadelphia metropolitan area. The site encompasses an industrial production plant currently owned by Monsey Products Company, Inc., and adjacent properties within the neighboring village of Kimberton. Water quality testing since 1981 has revealed numerous area domestic and commerical potable well water supplies contaminated with VOCs. A portion of this contamination originated from the onsite industrial production plant, which disposed of wastes in several lagoons during the 1950s. An EPA investigation in the spring of 1982 revealed the presence of organics, including TCE and DCE, in local ground water, surface water, and soil. In mid-1982, fifty seven, 55-gallon drums from an abandoned onsite septic system were excavated, removed, and disposed of offsite. In 1984 a remedial action program was initiated to excavate, remove, and dispose of approximately 2,050 cubic yards of soil from three former lagoon areas that were highly contaminated with VOCs. These lagoons are in proximity to numerous private water supply wells and less than one mile from French Creek, which is used for public recreation and fishing. VOCs are believed to ultimately discharge to surface waters to the north and east in the village of Kimberton via the ground water. In 1985, 67 residential and commercial wells were sampled and found to contain various concentrations of TCE, DCE, and vinyl chloride. As a result of these findings, the former and current owners of the plant agreed to provide 23 residential and commercial locations with an alternate source of drinking and contact water as an interim solution under the first operable unit. This second operable unit addresses the contaminated plume and the source of contamination. The primary contaminants of concern affecting the ground water and surface water are VOCs including TCE and DCE.

The selected remedial action for this site includes the continued provision of alternate water supplies through GAC treatment system and/or potable water supply storage tanks; pumping and treatment of ground water using an air stripping system with onsite discharge to an adjacent stream; long-term ground water monitoring; collection and treatment of surface water at the local ground water discharge point using an air stripping system; and institutional controls to restrict ground water use. The estimated present worth cost of this remedial action is $2,630,000, which includes annual O&M costs of $175,000.

PERFORMANCE STANDARDS OR GOALS: The current goal of ground water remediation is to achieve natural background conditions. Ground water will gradually meet MCLs through air stripping, natural flushing, and VOC degradation. VOC-contaminated ground water will be treated to attain MCLs including TCE 5 ug/l, DCE 7 ug/l, and vinyl chloride 2 ug/l. Surface water will be treated to meet ambient water quality criteria including TCE 21,900-45,000 ug/l and DCE 11,600 ug/l. Because the site is located in a nonattainment area for ozone, air emissions from the air stripping system will comply with State air toxic guidelines.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict the installation and use of new ground water extraction wells within the area affected by ground water contamination.

KEYWORDS: Air Stripping; Alternate Water Supply; Background Levels; Carbon Adsorption (GAC); Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Onsite Discharge; Onsite Treatment; Plume Management; Safe Drinking Water Act; State Standards/Regulations; State Permit; Surface Water; Surface Water Collection/ Diversion; Surface Water Monitoring; TCE; Treatment Technology; VOCs; Water Quality Criteria.

M.W. MANUFACTURING, PA

First Remedial Action
March 31, 1989

The M.W. Manufacturing site is a former copper recovery facility located in Montour County, Pennsylvania, two miles north of Danville. The Pennsylvania Department of Transportation (PennDOT) maintains a storage area immediately north of the site, and farmlands and wooded lots are adjacent to the site on the west and south. Mauses Creek flows in a southerly direction past the site. Several private residences, motels, gas stations, restaurants, and a Head Start school are located just north of the PennDOT storage area and rely on private ground water wells for drinking water. M.W. Manufacturing was engaged in secondary copper recovery from scrap wire, using both mechanical and chemical processes. Granular carbon wastes generated by the chemical process was dumped onsite, and spent solvents and acids were allegedly disposed of onsite. In 1972, M.W. Manufacturing filed for bankruptcy and the Philadelphia National Bank acquired the property. Warehouse 81 Inc. acquired the site in 1976, and subsequently formed a limited partnership with Domino Salvage, Inc. to recover wire at the site using mechanical recovery only. The initial remedial investigation revealed several areas posing potential threats to public health: the carbon waste pile, four wire-fluff waste piles, a surface impoundment, buried lagoon and contaminated soil, drums and storage tanks. This remedial action addresses the concerns for direct contact with and migration to ground water of contaminants from the carbon waste pile. The remaining areas are the subject of a long-term RI/FS. The primary contaminants of concern affecting the soil are VOCs including PCE and TCE; organics including PCBs; and metals including lead.

The selected remedial action for this site includes excavating the carbon waste pile (approximately 875 cubic yards of contaminated waste and contaminated underlying soil) and transporting the waste offsite to an incinerator facility and disposing of the ash in an offsite RCRA hazardous waste landfill. The estimated capital cost for this remedial action is $2,061,000. Since onsite remediation activities are anticipated to require less than one year, there are no O&M costs.

PERFORMANCE STANDARDS OR GOALS: Excavation of soil will be based on visible contamination. The carcinogens will be treated to less than 2 ug/kg for each individual contaminant which corresponds to the risk range of 10^{-4} to 10^{-6}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Debris; Direct Contact; Excavation; Incineration; Lead; Metals; Offsite Disposal; Offsite Treatment; PCBs; PCE; Public Exposure; RCRA; Soil; Solvents; TCE; Treatment Technology; VOCs.

NEW CASTLE SPILL, DE

First Remedial Action - Final
September 28, 1989

The New Castle Spill site is a former manufacturing facility 0.5 mile north of New Castle, Delaware, and is in the 100-year floodplain of the Delaware River. Commercial enterprises and residences neighbor the site and receive potable water from the deeper of the two aquifers underlying the site. The six-acre area associated with the site consists of municipal property, wetlands, and the Witco manufacturing facility which produced plastic foams using tris (2-chloropropyl)-phosphate (tris). In 1977, because of dead grass near the facility's drum storage area, Witco investigated the area and determined that four to five drums of tris had spilled and contaminated the soil and the shallow aquifer. The State subsequently pumped and discharged contaminated ground water into adjacent wetlands. A 1988 remedial investigation revealed that there is no longer a source of contamination at the site and that tris has contaminated the shallow aquifer but not the deeper aquifer. This limited response action addresses the ground water contamination in the shallow aquifer. The primary contaminant of concern affecting the ground water is tris (2-chloropropyl)-phosphate.

The selected remedial action for this site includes natural attenuation as the treatment of the principal threat to ground water; ground water, surface water, and sediment monitoring; and implementation of institutional controls. The estimated present worth cost for this remedial action is $466,147, which includes O&M costs of $25,000.

PERFORMANCE STANDARDS OR GOALS: Because there are no ARARs for the chemical of concern, tris (2-chloropropyl)-phosphate, EPA has established a TBC criterion of 4.4 mg/l which is based on an average daily intake of 0.125 mg/kg/day. Achieving the TBC level through natural attenuation is expected to take four years.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict further installation of wells in the shallow aquifer.

KEYWORDS: Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Organics; Surface Water Monitoring; Wetlands.

ORDNANCE WORKS DISPOSAL AREAS, WV

First Remedial Action (Amendment)
September 29, 1989

The Ordnance Works Disposal Areas site is on the west bank of the Monangahela River in Morgantown, Monongolia County, West Virginia. Several chemical facilities have operated at the site since the early 1940s, producing substances such as hexamine, ammonia, methyl alcohol, formaldehyde, ethylene diamine and coke. This operable unit addresses onsite contamination found in the following areas: an inactive landfill where solid and chemical wastes were disposed of; a scraped area which consists of bare soil adjacent to the landfill where solid wastes were buried; two former lagoon areas which were closed following a cleanup action in 1976; and several streams located in the southern portion of the site. This ROD supersedes a 1988 ROD which was rescinded after public comments prompted further investigation. The primary contaminants of concern affecting the soil and sediment are organics including cPAHs and metals including arsenic and lead.

The selected remedial action for this site includes excavation and onsite treatment of approximately 425 cubic yards of inorganic contaminated soil from hot spots in the scraped area and lagoon area using solidification, followed by placement of the treated soil in the landfill before capping; installing a multimedia RCRA Subtitle C cap on the landfill and regrading and revegetation; excavating approximately 13,460 cubic yards of organic-contaminated soil and sediment from the lagoon area, scraped area, and streams, with onsite treatment by bioremediation in a treatment bed; ground water, surface water, and sediment monitoring; and implementing deed restrictions to prohibit residential and industrial construction at the site. A contingency remedy has been selected which would include soil washing of contaminated soil as the principal treatment. The estimated present worth cost for this remedial action is $8,332,000, which includes annual O&M costs.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals for carcinogens (e.g., cPAHs and arsenic) are based on a 10^{-6} excess cancer risk level. Chemical-specific soil and sediment goals include cPAHs 44.7 mg/kg, arsenic 88.8 mg/kg, and lead 500 mg/kg.

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed to prohibit residential and industrial construction in the landfill area and residential construction in the remaining areas of the site.

KEYWORDS: Arsenic; Biodegradation/Land Application; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Sediment; Soil; Solidification/Stabilization; Surface Water Monitoring; Treatability Studies; Treatment Technology.

PUBLICKER/CUYAHOGA WRECKING, PA
First Remedial Action
June 30, 1989

The Publicker/Cuyahoga Wrecking site is a 37-acre, abandoned manufacturing plant in Philadelphia, Pennsylvania. A chemical company lies to the north, a marine terminal to the south, and the Delaware River to the east. Although the immediate area surrounding the site is primarily industrial, approximately 400,000 people live within one mile of the site. From 1912 to 1985, Publicker Industries owned and operated a liquor and industrial alcohol manufacturing plant at the site. The plant included 440 large tanks, storage drums, product stock, chemical laboratories, reaction vessels, production buildings, warehouses, a power plant, and several hundred miles of above- and below-ground process lines. Petroleum was also stored onsite during the late 1970s and the early 1980s. Publicker Industries discontinued operations and sold the property in 1986. EPA evaluated site conditions in 1987 following two explosions and a large fire. Tankers, pits/sumps, and numerous process lines were found to contain fuel oils or other contaminated oils. EPA initiated an emergency removal action in December 1987 to stabilize the site and control the threat of additional fires and explosions. Emergency removal activities included onsite bulking and storing of solid and liquid waste streams; disposing of highly reactive laboratory wastes and cylinders offsite; crushing approximately 3,100 emptied drums; wrapping overhead pipelines insulated with asbestos; and implementing a 24-hour fire and security watch. According to EPA estimates, over one million gallons of bulked waste materials remain onsite stored in dilapidated tanks and drums. Twelve waste streams have been identified, including base neutral liquids and solids, organic liquids and solids, oxidizing liquids and solids, water reactives, chlorides, crushed empty metal drums, and contaminated oils. This remedial action is designed to stabilize the site and enable continued site cleanup of soil, ground water, and asbestos. The primary contaminants of concern affecting the soil and ground water are VOCs, and other organics including PCBs and pesticides.

The selected remedial action for this site includes offsite treatment and disposal of the various waste streams in RCRA-permitted facilities; demolition of above-ground process lines, with proper packaging of contaminated insulation and onsite storage pending disposition in a subsequent remedial action; and offsite disposal of hazardous chemicals recovered from within the lines. The estimated capital cost for this remedial action is $13,900,000; there are no O&M costs.

PERFORMANCE STANDARDS OR GOALS: This initial remedy action will stabilize the site and remove the threat of fire or explosion by removing, treating, and disposing of waste streams offsite.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Asbestos; Debris; Decontamination; Direct Contact; Offsite Disposal; Ground Water; Offsite Treatment; Oils; Organics; PCBs; Pesticides; RCRA; Soil; Solidification/Stabilization; Temporary Storage; VOCs.

REESER'S LANDFILL, PA
First Remedial Action - Final
March 30, 1989

The Reeser's Landfill site is an inactive unlined municipal refuse dump located approximately five miles west of Allentown, Pennsylvania. The site is situated in a valley used predominantly for farming; however, there are residences to the west and northeast. Principal drainage in the area is via Iron Run, and the landfill drains via a series of seeps along the landfill perimeter and a network of surface channels. The 15-acre landfill is located on the southern portion of a 51.5-acre private parcel of land, and historically operated as an open pit iron mine. After mining operations ceased, local residents used the site as a dump, and in the late 1960s the property was leased to Reeser's Hauling Service. The landfill, which was never issued a solid waste permit, reportedly received a variety of wastes including domestic, commercial, industrial, and demolition wastes, and possibly battery wastes and drums. In 1981, after a fire burned in the northern corner of the landfill for several months, the State ordered Mr.

Reeser to properly close the landfill to comply with State municipal waste disposal regulations. This has yet to be carried out. EPA investigations have determined that there is no direct contact threat from the site soil or from ground water. Additionally, Reeser's Landfill has not adversely impacted the receptor stream, Iron Run, as evidenced by the presence of similar contaminant levels upstream and downstream from the site. The water quality of offsite and onsite ponds was also similar. Therefore, it was determined that no remedial action was necessary. There are no primary contaminants of concern affecting this site.

The remedial action for this site is a no action remedy with ground water review within five years.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy.

STRASBURG LANDFILL, PA

First Remedial Action
June 29, 1989

The Strasburg Landfill site is a 222-acre facility in western Newlin Township, Chester County, Pennsylvania. The surrounding area includes farmland and 200 homes in close proximity to the site. Two creeks, Brandywine and Briar Run, flow in close proximity to the site's western, southern, and eastern borders and receive surface drainage. A major aquifer underlying the landfill provides drinking water via private and public wells to all local residences. These private wells are as close as 720 feet to the landfill. In the spring of 1979 site owners began accepting industrial wastes and heavy metals which, by year's end, included more than 1,000 cubic yards of polyvinyl chloride wastes, 2,052 cubic yards of industrial wastes and sludge, and 35,000 gallons of heavy metal sludge. In December 1979 the State claimed that industrial wastes from the landfill caused excessive siltation of Briar Run Creek, and eight months later the State prohibited the site owners from receiving any additional industrial wastes. In 1980 sampling revealed VOC contamination in the ground water and by April 1983 leachate seeped at a rate of several gallons per minute from the southeastern portion of the landfill. After charging the site owners with operating violations and subsequently suspending their operating permit, the State ordered the landfill to be closed. As part of the closure plan, leachate was collected and stored in 5,000 gallon tanks, and the landfill was regraded and covered. The leachate is currently transported daily to an offsite treatment facility. Additionally, surface water runoff was directed toward a sediment pond which discharged directly into Briar Run Creek. Proposed corrective measures, however, were never completely implemented. Several seepage areas have since been observed near the landfill. One large seepage area is near the southeastern corner of the landfill. Liquid from the seep ultimately flows into a sediment pond near the eastern edge of the landfill which drains via a drainage pipe into Briar Run Creek. During heavy rainfalls, the sediment pond overflows into Briar Run Creek. The State has performed analyses of seep water from Briar Run Creek and of leachate from a manhole near the sediment pond and has monitored ground water for VOCs. Two residential drinking water wells contain multiple organic compounds. The primary contaminants of concern affecting the sediment pond and ground water are VOCs including TCE, PCE, toluene, and xylenes.

The selected remedial action for this site includes leachate collection, using an interceptor drain and offsite treatment; and provision of an alternate water supply to affected residences by installing point-of-use activated carbon treatment systems at residences with contaminated ground water above levels of concern. The estimated capital cost for the remedial action is $42,850, with estimated annual O&M costs of $4,500. Costs are based on an estimate of three residences requiring an alternate water supply.

PERFORMANCE STANDARDS OR GOALS: Treated ground water concentrations for carcinogenic contaminants will be such that the aggregate carcinogenic risk would be less than 10^{-6}. Target concentrations for noncarcinogenic contaminants will ensure a hazard index less than

1. Because of an ARAR waiver for the leachate, no chemical-specific cleanup goals were specified for the leachate seep.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; ARAR Waiver; Carcinogenic Compounds; Direct Contact; Ground Water; Ground Water Treatment; Interim Remedy; Leachate Collection; MCLs; O&M; Offsite Disposal; Offsite Treatment; PCE; TCE; Temporary Storage; Toluene; VOCs; Xylenes.

WHITMOYER LABORATORIES, PA
First Remedial Action
June 30, 1989

The 22-acre Whitmoyer Laboratories site is located in Jackson Township, Lebanon County, Pennsylvania. Land use surrounding the site is predominantly agricultural; however, there is some residential, commercial, and industrial development within 1.5 miles of the site. This includes a manufacturing plant to the south; a pharmaceutical factory to the east; a large, active limestone quarry to the west; and an elementary school to the northwest of the site. Portions of the site are within neighboring Tulpehocken Creek's 100-year floodplain. The creek, which is bordered by small, open wetlands areas, is being proposed for inclusion in Pennsylvania's scenic river system, with a "priority 1A status." Priority 1A status would designate the stream as being in most urgent need of protection. In 1957 site owners began producing organic arsenicals at the site. In 1964 widespread ground water contamination was discovered onsite leading to the placement of concentrated wastes in a concrete vault and the initiation of ground water pumping and treatment. Sludge from the ground water treatment was later consolidated in lagoons. In 1987 an EPA investigation revealed that approximately 69,000 gallons of concentrated liquids had been abandoned onsite in 18 tanks and 14 piping units. The wastes include 5,000 gallons of water-immiscible liquids, 25,000 gallons of water-miscible liquids with a high arsenic content, and 39,000 gallons of water-miscible liquids with a low arsenic content. All the tanks and piping units are within 400 feet of Tulpehocken Creek; 27 of the 32 tanks and piping are within 150 feet. Because the site slopes toward the creek, any release from a tank or piping failure is likely to contaminate the creek. Flooding of the creek could cause failure of these tanks, resulting in catastrophic release of contaminants to the creek. Additionally, contaminants released from the tanks and piping units could migrate to ground water and or the drinking water supply lines serving the site. Because the concentrated liquids pose significant health and environmental threats, their removal is addressed in this first operable unit. Subsequent operable units will identify potential soil, ground water, and surface water/sediment contamination and additional remedial actions that may be necessary. The primary contaminants of concern in the concentrated liquids are VOCs including PCE, and metals including arsenic.

The selected interim remedial action for this site includes consolidating, transporting offsite, and then treating, using thermal treatment or biodegradation, or recycling approximately 69,000 gallons of concentrated liquid wastes at a permitted RCRA facility, followed by disposing of treated water in offsite surface water and disposing of solid residues in an offsite landfill; decontaminating 32 tanks, approximately 2,000 feet of piping to meet RCRA Subtitle C closure standards, and tanks and piping left onsite for reuse, scrap, and disposal; and treating and disposing of the cleaning agent residues offsite at RCRA-permitted facilities. The estimated capital cost of this interim remedial action is $475,000, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: This interim remedial action will comply with ARARs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Biodegradation/Land Application; Carcinogenic Compounds; Closure Requirements; Debris; Decontamination; Direct Contact; Floodplain; Incineration/Thermal Destruction; Interim Remedy; Metals; Offsite Disposal; Offsite Treatment; PCE; RCRA; Treatment Technology; VOCs; Wetlands.

WILDCAT LANDFILL, DE

Second Remedial Action - Final

November 28, 1988

The Wildcat Landfill site is 2.5 miles southeast of Dover, in Kent County, Delaware. A 2.7-acre pond, formed by the landfill blocking natural drainage from upland areas, is located along the northwestern border of the site. The pond and the landfill are located along the west bank of the St. Jones River and are bordered to the north and east by the river and associated marshlands, and to the south and west by residential and commercial development. Portions of the site lie within the 100-year floodplain of the St. Jones River. The landfill was addressed in the first operable unit ROD signed in June 1988. This operable unit details the selection of a remedial alternative which addresses the largely environmental concerns the landfill poses to the pond and associated biota. The landfill was operated as a State-permitted sanitary landfill between 1962 and 1973, accepting both municipal and industrial wastes. Industrial wastes suspected to have been disposed of onsite include latex waste and paint sludges. During its 11 years of operation, the facility routinely violated operating and other permits issued by the regulatory agencies. In August 1973 the facility was ordered closed by the State and the site owners were required to cover the site with soil and vegetation. EPA began investigating the site in 1982. Surface water and sediment in the pond were contaminated by inorganic constituents leaching from the landfill. The primary contaminants of concern affecting the sediment and surface water in the pond are metals including arsenic, chromium; and lead.

The selected remedial action for this site includes draining, filling, and revegetating the pond area consistent with the landfill cover selected in the previous ROD; constructing a new pond elsewhere on the site; implementing institutional controls for land use restrictions; and ground water monitoring upgradient of the new pond. Pond water will be discharged to St. Jones River, to the north of the site.

PERFORMANCE STANDARDS OR GOALS: Prior to draining, the pond water will be analyzed to ensure that Federal Water Quality Criteria are met at the ground water discharge location.

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented to prevent development on the area of the filled pond. Restrictions will also be made to ensure that the integrity of the new pond is maintained.

KEYWORDS: Arsenic; Chromium; Filling; Floodplain; Ground Water Monitoring; Institutional Controls; Lead; Metals; Onsite Discharge; Sediment; Surface Water; Water Quality Criteria; Wetlands.

RECORDS OF DECISION ABSTRACTS
REGION IV
(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina,
South Carolina, Tennessee)

ABERDEEN PESTICIDE DUMPS (FAIRWAY SIX), NC
First Remedial Action
June 30, 1989

The Aberdeen Pesticide Dumps (Fairway Six) site is a former disposal area in Moore County, North Carolina, approximately 1.6 miles west-northwest of Aberdeen. The site is in a rural area, on the property of Partners in the Pits, LTD and Yadco of Pinehurst Inc., and bounded on the south by a railroad, on the north by the sixth fairway of the Pit golf course, and on the east and west by undeveloped property. Although the rural area is sparsely populated, residential growth is expected in the near future. In August 1984 the State was alerted that pesticides had been disposed of at and around the site for a number of years. A State inspection revealed that soil and debris were contaminated with pesticides. In June 1985 EPA initiated an emergency response action to excavate and remove onsite contaminated surface soil and two buried trenches. The soil and debris were disposed of offsite. In 1986 pesticides were detected in drinking water from four municipal wells and three private wells in Aberdeen causing EPA to reinvestigate the site. A subsequent investigation identified additional trenches containing approximately 12 million pounds of pesticide wastes. A test burn, conducted in December 1986, incinerated 12,000 pounds of pesticide-contaminated soil and debris using a mobile incinerator. Residual ash was stored onsite in twenty-seven 55-gallon drums. Additional removal funding was provided to excavate, shred, screen, and stockpile approximately 22,000 cubic yards of pesticide-contaminated materials. The predominant contaminants of concern affecting the soil and debris are chlorinated organo-pesticides.

The selected remedial action for this site includes excavating and homogenizing stockpiled pesticide-contaminated wastes; treating homogenized wastes in an onsite, mobile thermal treatment facility and reinjecting process wastewater or scrubber blowdown into the thermal treatment facility; analyzing ash to demonstrate ash is nonhazardous; monitoring air emissions; and redisposing residual ash onsite. The estimated present worth cost for this remedial action is $14,533,000. There are no annual O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will attain Federal and State ARARs; however, no chemical-specific goals were provided. Cleanup criteria established for the stockpile are to background levels and to the RCRA EP toxicity levels. The air pollution control system will achieve performance standards, which are defined as hydrogen chloride less than 4 pds/hr and particulate matter of less than 0.08 grains/dry ft^3 in the exhaust gas corrected to 7 percent oxygen content.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Monitoring; Background Levels; Carcinogenic Compounds; Debris; Direct Contact; Excavation; Incineration/Thermal Destruction; MCLs; MCLGs; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Soil; Treatability Studies; Treatment Technology.

AMERICAN CREOSOTE WORKS (JACKSON PLANT), TN
First Remedial Action
January 5, 1989

The American Creosote Works (ACW) site is located immediately southwest of Jackson, in central Madison County, Tennessee. The 60-acre site is in a partially developed area, and is bounded on the southwest by the South Fork of the Forked Deer River, on the west and north by Central Creek (a tributary to the South Fork of the Forked Deer River), on the east by a lumber mill, and on the south by the Seaboard Railroad. ACW conducted wood preserving operations using both creosote and PCP from the early 1930s until December 1981. Wastewater sludge from the treatment processes are listed as RCRA KOO1 waste. Untreated process wastewater and potentially contaminated stormwater runoff were discharged directly into Central Creek until 1973, at which time a levee was constructed to retain surface water runoff. The soil borrow pits used for the levee construction became sludge storage lagoons. A wastewater treatment system was installed onsite during 1974 and 1975, and operated until 1981. Reportedly, a "few" loads of filter sludge from the treatment system were spread on the back road on the east end of the property, and a recirculation pond overflowed more than once. In March 1983 five unlined lagoons containing creosote and PCP sludge and water overflowed, prompting the first of two EPA removal actions. In May 1983 the first removal consisted of pumping and treating approximately 30 million gallons of water, placing the remaining untreated oil/water mixture in empty tanks onsite, stabilizing the contaminated soil and sludge remaining in the lagoon material, and covering two lagoons with a clay cap. A second removal action was conducted in March 1986 after several storage tanks were determined to be leaking. The plant process facilities, including the treatment building, storage tanks, piping, ponds, and filters, are considered a point source of contaminants due to leakage from these structures and adjacent pits. Furthermore, several tanks and pipes are structurally unsound and open to precipitation, posing a threat of overflow or sudden, major release of contaminants. This remedial action will focus on reducing surface contamination resulting from degradation of the tanks and site structures, and minimize the potential for increased contamination due to flooding while further information is developed and analyzed. A subsequent remedial action will address contaminated soil, ground water, and surface streams. The primary contaminants of concern affecting the sludge, site structures, debris, and tanked liquids are VOCs and other organics including PAHs and phenols.

The selected remedial action for this site includes consolidation and incineration of sludge in the vicinity of the buildings and tanks; on- or offsite incineration of the oils and sludge from the tanks; treatment of tanked process liquids onsite using a sand filter, filter press, and carbon adsorption unit, followed by discharge to a surface stream; decontamination and offsite disposal of site structures (e.g., buildings, tanks, pipes) in a RCRA Subtitle D facility; construction of a flood-protection dike; deed restrictions and site fencing; and site stabilization including monitoring onsite water levels behind the dikes and pumping, treating (as needed), and discharging impounded water pending a final remedy. The estimated present worth cost for this remedial action ranges from $5,000,000 to $6,000,000. Annual O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Remedy reduces potential for direct exposure to sludge and process liquids while further investigations are conducted. Quantitative goals were not provided for final site remediation.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to restrict further use of the site.

KEYWORDS: Carbon Adsorption; Carcinogenic Compounds; Clean Water Act; Debris; Decontamination; Direct Contact; Floodplain; Incineration/Thermal Destruction; Institutional Controls; Levees; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Sludge; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs.

AMERICAN CREOSOTE WORKS (PENSACOLA PLANT), FL

Second Remedial Action

September 28, 1989

The 18-acre American Creosote Works (Pensacola Plant) site, is in a dense, moderately commercial and residential area of Pensacola, Florida, approximately 600 yards from Pensacola Bay and Bayou Chico. American Creosote Works Inc. operated a wood preserving facility onsite from 1902 to 1981. During this time, process wastewater containing pentachlorophenol (PCP) was discharged into two 0.9-and 1.8-acre unlined, onsite surface impoundments. Prior to 1970, wastewater in these ponds was allowed to overflow through a spillway into the neighboring

Bayou Chico and Pensacola Bay. After 1970, wastewater was periodically drawn from the ponds and discharged to designated onsite spillage areas. Additional discharges occurred during periods of heavy rainfall when the ponds overflowed. In March 1980, the city found considerable quantities of oily, asphaltic, creosotic material in the ground water near the site. Because of the threat posed to human health and the environment due to frequent overflows from the waste ponds, EPA and the State performed an emergency cleanup in 1983, which included dewatering the two ponds, treating the water via coagulation and filtration, and discharging treated water to the city sewer system. The sludge in the ponds was then solidified and capped. EPA signed a ROD in 1985 requiring all onsite and offsite contaminated solids, sludge, and sediment to be placed in an onsite RCRA-permitted landfill. Because the State did not concur with the selected remedy, no remedial action was taken. Consequently, a post remedial investigation was conducted in 1988 to characterize the extent of contamination followed by a post feasibility study in 1989 to identify, develop, and evaluate alternatives. This ROD is the first of two planned operable units and addresses remediation of contaminated surface soil. A second operable unit will address treatment of contaminated subsurface soil, sludge, and ground water. The primary contaminants of concern affecting the surface soil are organics including dioxins, cPAHs, and PCP.

The selected remedial action for this site includes excavating and treating 23,000 cubic yards of PAH-contaminated soil using solid-phase bioremediation in an onsite land treatment area followed by onsite disposal of treated soil in the excavated areas or spreading the soil over the entire site; implementing temporary erosion control measures to preserve surface water quality; collecting leachate and drain water for spraying over the treatment area to moisten soil; monitoring dissolved oxygen, pH, nutrients, and soil moisture content; removing debris, repairing fences, sampling the cap and disposing of drums containing drilling mud; and implementing land and ground water use restrictions. The estimated present worth cost is $2,275,000 which includes an O&M cost of $319,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels are based on cancer potency factors (CPF) and 10^{-5} excess cancer-risk levels. Soil cleanup goals include cPAHs 50 mg/kg, dioxins 2.5 ug/kg (based on 2,3,7,8-TCDD toxicity equivalency), and PCP 30 mg/kg.

INSTITUTIONAL CONTROLS: Ground water and land use restrictions will be implemented.

KEYWORDS: Biodegradation/Land Application; Carcinogenic Compounds; Dioxin; Direct Contact; Excavation; Floodplain; Institutional Controls; Leachate Collection; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Soil; Treatability Studies; Treatment Technology.

AMNICOLA DUMP, TN

First Remedial Action - Final
March 30, 1989

The Aminicola Dump site is an 18-acre inactive construction debris disposal site located in Chattanooga, Tennessee. The site is located along the east bank of the Tennessee River, approximately 0.5 mile upstream of the intake for the primary drinking water source sor the city of Chattanooga. The site is bordered on thenorth by dense vegetation and vegtation-covered debris, and on the south by an industrial research facility. The site drains westerly towards the river. During the 1930s the Amnicola Dump site was reportedly used for clay mining operations, resulting in several water-filled pits. During the period from 1957 to 1964 construction debris and other unidentified wastes were occasionally disposed of in many of the open pits. The site was then operated as a dump by the city of Chattanooga until 1973, predominantly receiving constuction debris including a substantial amount of waste wood which was subsequently incinerated onsite. The ashes eventually filed 12 acres of the 18-acre site. The only industrial wast reportedly disposed of at the site was latex waste. Unauthorized waste dumping and concerns about leachage discharge in prosimity to the drinking water intake ara led to closure of the site in 1973. Closure included covering, grading slopes, filling depressions, draining standing water, applying riprap along the western perimeter, constructing drainage ditches, and seeding the entire surface area of the fill. The current owner and operater has been burning, storing, and handling creosoted railroad ties, contributing to elevated PHAs in surface soil. The primary contaminants of concern affecting the soil, debris, and ground water are organics including PAHs, and metals including chromium.

The selected remedial actionfor this site includes excavating and screening 600 cubic yards of contaminated soil/debris with onsite solidification/fixiation of 400 cubic yards of contaminated soil and 200 cubic yards of debris (debris exceeding cleanup goals or LDR requirements will be disposed of offsite), followed by onsite disposal of solidified mass; ground water monitoring for 4 years; conducting a public health assessment 5 years after completion of the remedial action; and implementation of institutional controls including ground water and land use restrictions. The estimated present worth cost for this remedial action is $640,000 with O&M costs of $384,000.

PERFORMANCE STANDARDS OR GOALS: Soil will be treated to the health-based cleanup goal of total cPAHs 100 mg/kg. Ground water will be brought to ACLs through ground water use restrictions. Individual ACLs were provided for nine contaminants, including chloroform 86 ug/l and chromium 890 ug/l.

INSTITUTIONAL CONTROLS: Land use restrictions will be imposed on the site to prevent the accumulation of contamination exceeding the surface soil cleanup goals as a result of handling, storage or burning creosoted railroad ties. Ground water use restrictions will be imposed within a reasonable distance from the site in keeping with the establishment of ACLs.

KEYWORDS: Carcinogenic Compounds; Chromium; Debris; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Soil; Solidification/Stabilization; Treatment Technology.

CAPE FEAR WOOD PRESERVING, NC

First Remedial Action - Final
June 30, 1989

The 9-acre Cape Fear Wood Preserving site is in Cumberland County, North Carolina on a 41-acre tract of land. The predominantly flat site is comprised of the wood treatment facility, wetlands, and undisturbed forests. A variety of land uses exist in the area including industrial, agricultural and residential. The Cape Fear Wood Preserving facility operated from 1953 to 1983 first using a wood-treating process that included creosote and later switching to a technique known as the copper-chromium- arsenic (CCA) process. Liquid and sludge wastes generated by both of these processes were pumped into a drainage ditch and an unlined lagoon. In 1977, as a result of a State site investigation that revealed coal tar creosote contamination, the property owner was ordered to remove 900 cubic yards of creosote contaminated soil. In 1984 EPA conducted a site investigation which resulted in an emergency removal action. This action included excavating contaminated soil and sludge followed by offsite disposal and pumping lagoon water into onsite storage tanks. In 1986, 500 gallons of creosote spilled from a storage tank causing EPA to conduct a second emergency response. Emergency response activities included removal and solidification of 10 cubic yards of sludge and pumping of 15,000 gallons of CCA waste water into onsite storage tanks. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including benzene; other organics including PAHs; and metals including arsenic and chromium.

The selected remedial action for this site includes offsite disposal of CCA salt crystals found in the drainage system and solidified creosote at a RCRA landfill and offsite disposal of asbestos-containing pipe insulation in the county solid waste facility; removal and decontamination of onsite pipes and tanks to be sold for scrap metal or disposed of in the county solid waste facility; excavation and onsite treatment of soil and sediment using soil flushing as the preferred alternative or a low thermal desorption process to remove organics followed by soil washing or fixation/stabilization/solidification to address inorganics (a soil washing treatability study will determine if the preferred alternative would be appropriate) followed by placement of treated soil and sediment in the excavated area and revegetation; pumping with onsite treatment of ground water and surface water with offsite discharge at a POTW or a surface stream; sale of 50,000 gallons of CCA solution to a buyer, if no buyer is found, CCA solution and CCA-contaminated wastewater will be treated using the ground water treatment system; and ground water monitoring. The estimated present worth cost for this remedial action ranges from $14,370,000 to $14,910,000 including present worth O&M costs which range from $1,020,000 to $1,310,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The ground water cleanup criteria established for this site include benzene 5 ug/l (MCL), cPAHs 10 ug/l (CLRQL), and noncarcinogenic PAHs 14,350 ug/l. For surface water the criteria include arsenic 12 ug/l (AWQC), chromium 11 ug/l (AWQC), and copper 14 ug/1 (background). The soil criteria include arsenic 94 mg/kg, benzene 0.005 mg/kg (CLQRL), chromium 88 mg/kg (background), cPAHs 2.5 mg/kg, and total PAHs 100 mg/kg (background); and the sediment criteria include total PAHs 3 mg/kg, arsenic 94 mg/kg, and chromium 88 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Asbestos; Benzene; Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Debris; Decontamination; Direct Contact; Dredging; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Treatment; PAHs; Plume Management; Public Exposure; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; Soil Washing/Flushing; State Standards/Regulations; Surface Water; Surface Water Treatment; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Wetlands.

CAROLAWN, SC

First Remedial Action

September 27, 1989

The Carolawn site is an approximately 60-acre, abandoned waste storage and disposal facility in Fort Lawn, Chester County, South Carolina. Rural and agricultural areas surround most of the site. Four residences lie within 300 yards of the site, and approximately 30 single family residences lie within a 2-mile radius of the site. The site is bordered to the east by Fishing Creek, which empties into the Catawba River eight miles south of the site. Approximately 2,500 people receive their water supply from the Catawba River. Storage trailers and tanks and as many as 480 drums of solvents and liquid and solid wastes have been stored inside a 3-acre fenced portion of the property since 1970. An additional 660 drums and 11 storage tanks were located outside the fenced area to the north. Drums, waste, and contaminated soil were removed from the site by EPA in 1981, and all nearby residences were provided an alternative water source. An additional 17 storage tanks were removed in 1986 by the PRPs. Contaminants have been detected in ground water flowing underneath the site which discharges into Fishing Creek. This ROD addresses remediation of contaminated ground water. A subsequent ROD will address remediation of the contaminated soil, if necessary. The primary contaminants of concern affecting the ground water are VOCs including TCE and metals including lead.

The selected remedial action for this site includes ground water pumping and treatment using one or more of the following methods: air stripping, biodegradation, activated carbon filtration, and metals removal and will be determined during the remedial design stage based on the level of contaminants found and the treated ground water discharge point selected; implementing deed restrictions; plugging condemned wells; disposing the two inactive incinerators and two remaining drums; and monitoring ground water and soil. The estimated present worth cost for this remedial action ranges from $1,141,071 to $1,356,305, with a present worth O&M cost for over 30 years ranging from $753,433 to $916,723, depending on the extent of treatment and ultimate discharge point for the treated water.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet SDWA MCLs. Target cleanup levels included TCE 5 ug/l and lead 5 ug/l.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented.

KEYWORDS: Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; Offsite Discharge; O&M; Organics; Safe Drinking Water Act; TCE; VOCs; Water Quality Criteria.

CELANESE (SHELBY FIBER OPERATIONS), NC

Second Remedial Action - Final
March 28, 1989

The 450-acre Celanese Fiber Operations (CFO) site is a polyester raw-material production facility located in Cleveland County, North Carolina. The plant's facilities include a plant production area, wastewater treatment area, former waste disposal areas, and a land farm area. The adjacent land is rural, and some residences are located within 1 mile of the site. The plant began operations in 1960 as Fiber Industries, Inc. and manufactured polyester polymer chip and filament yarn using the chemicals dimethyl terephthalate and ethylene glycol. The plant's waste treatment facility was constructed in phases concurrent with the manufacturing plant; thus, in the years prior to the completion of the treatment facility, chemical wastes were dumped directly into a drainage ditch. Treated effluent has been discharged to Buffalo Creek since the mid-1960s when Fiber Industries, Inc. completed construction of the treatment facility. Celanese Corporation bought the site and facilities in 1983. In addition to the discharge from the wastewater treatment plant, CFO also discharges alum-treated bandcaster water directly to Buffalo Creek. Several areas around the plant have been used for waste disposal, including old burning pits for normal plant wastes (polyester and trash), a glycol recovery unit (GRU) sludge burial area, two soak-away ponds used to contain treated sanitary sewage from 1960 to 1969, and a former drum storage and staging area. Four additional buried waste areas are located to the north and outside of the main plant perimeter fence: a polymer and fiber landfill, a construction debris landfill, a 21-acre sludge disposal area, and a drum storage area which temporarily stored 2,000 to 3,000 drums of waste chemicals and solvents from 1970 to 1978. The drums were removed by 1978. A 1988 ROD addressed extraction and treatment of contaminated ground water. This second operable unit addresses source control including contaminated sludge and soil associated with the GRU trenches and burn pit areas. The primary contaminants of concern affecting the soil and sediment are VOCs including benzene and TCE; other organics including phenols and PAHs; and metals including lead and chromium.

The selected remedial action for this site includes excavation of 3,710 cubic yards of GRU sludges, plastic chips, burn pit residuals, and sediment with onsite incineration of contaminated soil and GRU sludge and chemical fixation (solidification) of incinerator ash, plastic chips, burn pit residuals and sediment, followed by disposal of the inert, solidified material in the excavated area; regrading and filling of excavated area; and ground water monitoring. The estimated present worth cost for this remedial action is $3,500,000; O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will attain a 10^{-6} cancer-risk level as it removes the source of the ground water contamination. No chemical-specific standards or goals were provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Excavation; Filling; Incineration/Thermal Destruction; Lead; Metals; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Public Exposure; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; TCE; Treatment Technology; VOCs.

CHEMTRONICS, NC

First Remedial Action (Amendment) - Final
April 26, 1989

This ROD amends the April 5, 1988, Chemtronics ROD which included an incorrect calculation regarding the chemical quality of the ground water. The Chemtronics site is an active waste disposal facility located in a rural area of Swannanoa, Buncombe County, North Carolina. The 1,027-acre site was developed as an industrial facility in 1952 and was purchased by Chemtronics, Inc. in 1978. Approximately 10 acres of the site were used for waste disposal operations. Records indicate the presence of 23 individual onsite disposal areas (DAs) which are grouped into six discrete areas: DA-6, DA-7/8, DA-9, DA-10/11, DA-23, and the acid pit. From 1952 to 1971 solid waste materials and possibly solvents were incinerated in pits and chemical wastes, including waste materials generated in the production of the chemical warfare agent 3-quinuclidinyl benzilate (BZ) and the tear gas agent o-chlorobenzylidene malononitrile (CS), were placed in 55-gallon drums with a neutralizing solution, and then buried onsite in trench-type landfills. From 1971 to 1975 small volumes of liquid wastes were disposed of in onsite pits and trenches, and solid wastes, rocket motors, explosive wastes, and other waste types were burned. From 1975 to 1979 Chemtronics, Inc. constructed pits and trenches as needed, for the disposal of spent acid and various organic wastes. In 1980 the State ordered Chemtronics to discontinue all discharges to site pits and trenches. The pits were subsequently backfilled. Starting in 1979, Chemtronics installed a 500,000-gallon lined lagoon over an old leaching field for the biotreatment of wastewater. The incompatibility of the liner with the brominated wastes introduced into the lagoon caused the lagoon to release its contents. The lagoon was reconstructed in August 1980, using a different liner, and deactivated in 1984. In September 1984, the U.S. Army Toxic Hazardous Materials Agency sampled two drums in DA-10/11. These drums were suspected of containing wastes from the production of BZ. Although no BZ was found, EPA initiated an immediate removal of these drums in January 1985 due to heightened public awareness of the site. In the original ROD the selected remedial action for the contaminants and contaminated soil in DA-23 was soil fixation/stabilization/solidification, followed by capping. This remedy has been changed to capping only. The original remedy was selected due to the concentration level of the contaminant benzylic acid a benzophenone found in the ground water downgradient of DA-23. However, a transcription error was discovered in the analytical results for this ground water sample. The laboratory reported the concentrations as 470 mg/l instead of 470 ug/l. Subsequent sampling verified that the correct concentration was in the 0-470 ug/l range. Therefore, EPA elected to change the source control remedial action for DA-23 to capping only. The primary contaminants of concern affecting the soil, sediment, ground water and surface water are VOCs including benzene, toluene, PCE, and TCE; other organics including pesticides and explosives; and metals including arsenic, lead, and chromium.

The selected remedial action for this site includes multi-layer capping of DA-6, DA-7/8, DA-9, DA-10/11, DA-23 and the acid pit area; ground water pumping and treatment using air stripping, carbon adsorption, or metal removal with treatment and discharge to be determined during design; sampling of pond water and sediment and, if necessary, surface water treatment using the ground water treatment system and onsite disposal of sediment; implementation of institutional controls and access restrictions; and sediment, ground water, and surface water monitoring. The estimated present worth cost for this remedial action is $2,248,900 with an annual O&M cost of $501,900.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels are provided based on MCLs and several TBCs. Individual goals include TCE 0.005 mg/l (MCL), benzene 0.005 mg/l (MCL), PCE 0.007 mg/l (RSD), toluene 2.0 mg/l (PMCLG), RDX 0.035 mg/l (USAIWQC), TNT 0.044 mg/l (PPLV), lead 0.05 mg/l. Individual soil cleanup goals include PCBs 10 mg/kg (TSCA), RDX 95 mg/kg (PPLV), TNT 305 mg/kg (PPLV), and CS 43.3 mg/kg (PPLV).

INSTITUTIONAL CONTROLS: Institutional controls will be implemented; however, none were specified.

KEYWORDS: Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Disposal; Onsite Treatment; PCE; Pesticides; RCRA; Closure Requirements; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Monitoring; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Water Quality Criteria; VOCs.

CIBA-GEIGY (MCINTOSH PLANT), AL
First Remedial Action
September 28, 1989

The 1,500-acre Ciba-Geigy (McIntosh Plant) site is in southern Washington County, northeast of McIntosh, Alabama. The plant's initial operations, which began in 1952, were devoted solely to the manufacture of DDT. In 1970, the facility expanded its manufacturing operations to include herbicides, insecticides, and chelating and sequestering agents. Other products produced by Ciba-Geigy include resins and additives used in the plastics industry. Wastes and residues generated during production operations were managed onsite. In 1985, EPA issued Ciba-Geigy a RCRA Part B permit for active waste management units onsite. The permit included a corrective action plan requiring Ciba-Geigy to remove and treat contaminated ground water and surface water at the site. In 1987, as part of this plan, Ciba-Geigy installed a ground water pumping and treatment system which has been effective in addressing the ground water contamination. This first of three planned operable units addresses ground water contamination in the shallow Alluvial aquifer. The second operable unit will address the deeper Miocene aquifer and the final operable unit will address contamination of soil at eleven former waste management areas. The primary contaminants of concern affecting the ground water are VOCs including benzene and toluene; other organics including pesticides; and metals including arsenic.

The selected remedial action for this site includes no further action for the shallow aquifer beyond continued ground water pumping and onsite treatment using an existing biological wastewater treatment system, followed by discharge to the Tombigbee River under an NPDES permit; and ground water and effluent monitoring. The estimated annual O&M cost for this remedial action is $325,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals are based on SDWA MCLs or PMCLs. Ground water cleanup goals include benzene 5.0 ug/l (MCL), toluene 2,000 ug/l (PMCL), and arsenic 50 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carcinogenic Compounds; Clean Water Act; Ground Water; Ground Water Monitoring; MCLs; MCLGs; Metals; No Action Remedy; O&M; Offsite Discharge; Organics; Pesticides; RCRA; Safe Drinking Water Act; Toluene; VOCs.

KASSOUF-KIMERLING BATTERY, FL
First Remedial Action
March 31, 1989

The Kassouf-Kimerling Battery site, formerly known as the Timber Lake Battery Disposal and the 58th Street Landfill, is in Tampa, Florida. The site consists of a 42,000 square feet landfill area in which empty lead-acid battery casing and fill dirt were deposited in September 1978. The estimated volume of fill is 11,350 cubic yards. Land use in the area includes residential, commercial, and industrial development to the south; and undeveloped land occupied by small lakes and marshes to the north, east, and west. Surface water flows from the west marsh to the east marsh by way of a canal cut through the site and eventually discharges into the Palm River. This remedy addresses the landfill wastes and contaminated underlying soil. A second and final operable unit will address contaminated sediment and surface water in the adjacent wetlands. The primary contaminants of concern affecting the soil, debris, and ground water are metals including arsenic, cadmium, and lead.

The selected remedial action for this site includes excavation of the landfill wastes and contaminated underlying soil, followed by treatment using solidification/chemical fixation and onsite disposal in the landfill area. Specific protocols for treatment will be determined by bench-scale testing. The estimated present worth cost for this remedial action is $2,500,000 - $3,500,000.

PERFORMANCE STANDARDS OR GOALS: The soil and debris in the source area will be treated to meet RCRA criteria including EP toxicity concentrations. Ground water standards including MCLs and AWQC will be met over a short period of time due to the excavation and fixation of the landfill materials.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Excavation; Floodplain; Ground Water; Lead; Metals; MCLs; MCLGs; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; Treatability Studies; Treatment Technology; Water Quality Criteria.

NEWSOM BROTHERS/OLD REICHHOLD, MS

First Remedial Action - Final
September 18, 1989

The 81-acre Newsom Brothers/Old Reichhold site is in Marion County, Columbia, Mississippi. The site is in a predominantly residential area and was used as a wood processing facility under several owners from 1936 until 1977, when a fire and explosion destroyed the facility. Site activities included producing tall oils, turpentine, calcium and zinc resinates, and polymerized and rubber resins. Furthermore, PCP was apparently mixed with diesel oil and sold, and xylenes were used in a number of processes. A State investigation in 1976 revealed that wastewater containing phenols, oil, and grease was discharging to a small creek. Further investigations resulted in EPA performing an immediate removal action in 1984, which included the removal of over 600 surface drums from the site and excavating and draining two ponds, one of which was subsequently filled with clean fill. Onsite buried drum areas were the target of another EPA removal action conducted from 1987 to 1988. Approximately 3,900 drums were excavated and shredded; drum contents were disposed of offsite; and 1,920 tons of soil were removed. In addition there is an extensive system of concrete drains that served to collect and drain spilled wastes and rainwater that has an area of runoff of approximately 300,000 square feet. There is an estimated 650 cubic yards of bulk hazardous substances remaining onsite consisting of black tar-like waste material and a resin material in three excavations and in the drainage system. The primary contaminants of concern affecting the soil, sediment, and bulked wastes are organics including PAHs, PCBs, and PCP; and metals.

The selected remedial action for this site includes excavation and offsite disposal of 30,300 cubic yards of contaminated soil and 7,300 cubic yards of contaminated pond and creek sediment; excavation and offsite incineration of 650 cubic yards of tar-like waste material and any soil/sediment containing RCRA hazardous wastes, followed by offsite disposal; draining, filling, and capping onsite ponds; recontouring the site; and ground water monitoring for five years. The estimated present worth cost for this remedial action is $14,180,000, which includes an estimated present worth O&M cost of $520,225.

PERFORMANCE STANDARDS OR GOALS: Soil, sediment, and waste material cleanup goals were based on 10^{-6} excess-cancer risk. A chemical-specific soil and sediment goal was selected for cPAHs as 10 mg/kg. Additional soil/sediment levels were developed for other organic-contaminated areas including PCP 1.2 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Filling; Ground Water Monitoring; Incineration/Thermal Destruction; Leachability Tests; Metals; Offsite Disposal; Offsite Treatment; O&M; Onsite Discharge; Organics; PAHs; PCBs; RCRA; Sediment; Soil; State Permit; State

Standards/Regulations; Toluene; Toxic Substances Control Act; Treatment Technology; Water Quality Criteria.

SMITH'S FARM, KY
First Remedial Action
September 29, 1989

The Smith's Farm site is a 560-acre property in a rural area of Bullitt County, Kentucky. The site is bordered on the north, east, and west by forested hills and on the south by a residential area. Within the 560-acre property there is a 37.5-acre landfill that, until recently, was permitted by the State for the disposal of solid waste. The owner of this landfill was cited at various times by the State for permit violations. The property also includes an 80-acre area upgradient of the permitted landfill on a mile-long ridge between two intermittent creeks where the unpermitted disposal of drums containing hazardous waste occurred over a 20-year period. EPA investigations from 1979 to 1984 resulted in the removal of 6,000 surface drums containing hazardous waste including PCB-contaminated waste. This remedy addresses contaminated onsite soil, sediment, and drums within the 80-acre area. A second operable unit will address the remaining potential threats associated with the landfill, deep ground water aquifers, and other suspected areas of drum disposal. The primary contaminants of concern affecting the soil and sediment are organics including PCBs and PAHs, and metals including lead.

The selected remedial action for this site includes excavation and onsite incineration of approximately 26,200 cubic yards of contaminated soil, surface drums, buried drums, and fill material from Area B (as defined in the RI/FS), and approximately 5,200 cubic yards of contaminated onsite sediment from the valley streams; solidification/fixation of approximately 50 percent of the treated material followed by placement of all treated or solidified material in Area B; incineration of a small volume of hot spot material in Area A and consolidation of waste and construction of a RCRA cap over Area A; construction of a leachate-collection system to collect leachate from Area A; access restrictions (fencing) around contaminated areas; ground water monitoring for up to 27 years; maintenance of the RCRA cap and the leachate collection system; and leachate removal and disposal for up to 30 years. The estimated present worth cost for this remedy is $26,900,000, which includes O&M costs of $1,330,000.

PERFORMANCE STANDARDS OR GOALS: Action levels for contaminated soil and/or sediment were determined based on an excess lifetime cancer risk of 10^{-5} with the exception of lead which was based on a hazard index less than 1. Specified goals include cPAHs 5 mg/kg, PCBs 2 mg/kg, and lead 500 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Closure Requirements; Debris; Direct Contact; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction; Leachate Collection; Lead; MCLs; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology.

STAUFFER CHEMICAL/COLD CREEK, AL
First Remedial Action
September 27, 1989

The Stauffer Chemical Cold/Creek site is in Bucks, Mobile County, Alabama, approximately 20 miles north of Mobile, Alabama. The area is predominantly industrial, with a few small rural residential communities within a few miles of the site. The Mobile River borders the site to the east. The Cold Creek plant began operating in 1966 under the ownership of the Stauffer Chemical Company and is currently owned and operated by ICI Americas, Inc. Until 1974, an unknown amount of sludge and solid wastes containing a variety of herbicides and pesticides were placed in two waste disposal sites, referred to as the Cold Creek North and South Landfills. Both were closed in 1974 with geomembrane caps and side-wall liners. One clay-lined lagoon was used for neutralization of wastewater until 1975, and was closed in 1978. A new membrane-lined pond was constructed to replace it and is currently in use. Under a consent agreement with EPA, Stauffer completed a remedial investigation in May 1988, which identified contamination of the soil, pond sludge, swamp sediment, and ground water. Although there are four media of concern at the Stauffer site, this remedial action addresses the contaminated ground water, because ground water is the source for drinking water for the area. Additional RODs are planned for the source control operable units and the Cold Creek Swamp. The primary contaminants of concern affecting the ground water are VOCs including carcinogenic compounds such as carbon tetrachloride, and other organic compounds including pesticides.

The selected remedial action for the ground water operable unit at this site includes a modified ground water intercept and treatment system with surface water discharge. This alternative involves continued operation of the existing intercept and treatment system, which consists of aeration via spray nozzles with discharge to a treatment pond and then to the Mobile River; installation of additional extraction wells, based on ground water quality characteristics, water-table gradients, and pumping activities at the site and adjacent properties; design and implementation of modifications to the treatment system; and monitoring of effluent, ground water concentrations, and pumping rates. Further investigation and treatability studies are necessary before EPA can determine the remedial action for the source units (soil and pond sediment) and the swamp. Bench and/or pilot-scale testing of in-situ treatment alternatives for some of the source units, such as a wastewater treatment pond, is appropriate as part of the remedial design. A range of treatment technologies including thermal desorption and vapor extraction is being considered. The estimated total capital cost for this remedial action is $3,119,200, which includes O&M costs. Specific O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet State and Federal ARARs including MCLs and risk reference doses (RfDs) developed by EPA. Chemical-specific cleanup goals include carbon tetrachloride 5 ug/l (MCL). Surface water discharge must meet concentration limits specified in the NPDES permit.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; Pesticides; RCRA; Safe Drinking Water Act; Treatability Tests; Treatment Technology; VOCs.

STAUFFER CHEMICAL/LEMOYNE, AL

First Remedial Action
September 27, 1989

The Stauffer Chemical LeMoyne site is in Axis, Mobile County, Alabama, approximately 20 miles north of Mobile, Alabama. The area is predominantly industrial, with a few small rural residential communities within a few miles of the site. The Mobile River borders the site to the east. The LeMoyne facility was previously owned by the Stauffer Chemical Company, which began operations in 1953. Now the RCRA-permitted facility is currently owned and operated by Akzo Chemicals, Inc., which purchased the facility in 1987. Multi-product organic and inorganic chemicals are manufactured at the facility. From 1965 to 1974, under the operation of Stauffer, waste from the plant was placed in an unlined landfill located approximately one mile east of the main plant. The waste included 11,000 to 12,000 tons of brine muds in addition to plant refuse, used samples, and absorption oil. The landfill was closed in 1975 with an impermeable membrane cap and side-wall liner. Wastewaters from the processes were held in ponds, some of which discharged to the Cold Creek Swamp. All of the ponds except one are clay lined and have been closed under the direction of the State. New membrane-lined ponds were installed during the 1970s to replace the closed ponds. Under a consent agreement with EPA, Stauffer completed a remedial investigation in May 1988, which identified contamination of the soil, pond sludge, swamp sediment, and ground water. Although there are four media of concern at the Stauffer site, this remedial action addresses the contaminated ground water, because ground water is the source for drinking water for the area. Additional RODs are planned for the source control operable units and the Cold Creek Swamp operable unit. The primary contaminants of concern affecting the ground water are VOCs including carcinogenic compounds such as carbon tetrachloride, and other organic compounds including pesticides.

The selected remedial action for the ground water operable unit at this site includes a modified ground water intercept and treatment system with surface water discharge. This alternative involves continued operation of the existing intercept and treatment system, which consists of aeration via spray nozzles with discharges to a treatment pond and then to the Mobile River; installation of additional extraction wells, based on ground water quality characteristics, water-table gradients, and pumping activities at the site and adjacent properties; design and implementation of modifications to the treatment system; and monitoring of effluent, ground water concentrations, and pumping rates. Further investigation and treatability studies are necessary before EPA can determine the remedial action for the source units (soil and pond sediment) and the swamp. Bench and/or pilot-scale testing of in-situ treatment alternatives for some of the source units, such as a wastewater treatment pond, is appropriate as part of the remedial design. A range of treatment technologies including thermal desorption and vapor extraction is being considered. The estimated total capital cost for this remedial action is $3,119,200, which includes O&M costs. Specific O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet State and Federal ARARs including MCLs and RfDs developed by EPA. Chemical-specific cleanup goals include carbon tetrachloride 5 ug/l (MCL). Surface water discharge must meet concentration limits specified in the NPDES permit.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; Pesticides; RCRA; Safe Drinking Water Act; Treatability Tests; Treatment Technology; VOCs.

SYDNEY MINE SLUDGE PONDS, FL
First Remedial Action - Final
September 29, 1989

The Sydney Mine Sludge Ponds site occupies 9.5 acres of a 1,700-acre former phosphate mining site in Brandon, Hillsborough County, Florida. From 1973 to 1981 the county rented the site for disposal of septic wastes, waste automotive oils, grease trap wastes, and manufacturing cutting oils. An estimated 16 million gallons of wastes were deposited in three small pits. An EPA site investigation in 1979 identified organics and heavy metal contamination in monitoring wells near the waste pits. Sampling was also performed in Turkey Creek which flows through the mine site about a mile from the waste pits. Upstream and downstream sediment samples exhibited elevated levels of metals. Disposal operations ended in September 1981 when the State denied issuance of a second operation permit for the site. The State and county began a two-phase cleanup effort in 1984. The first phase included construction of a slurry wall around the waste pits; excavation and onsite incineration of approximately 10,900 cubic yards of pit wastes; and pumping and onsite treatment of ground water. The second phase included excavation of approximately 15,000 cubic yards of contaminated soil with onsite treatment by air-drying followed by offsite disposal. This operable unit addresses ground water contamination at the site. The primary contaminants of concern affecting the ground water are VOCs including benzene, toluene, TCE, and xylenes.

The selected remedial action for this site includes continued ground water pumping with onsite treatment by air stripping and spray irrigation on land adjacent to the waste disposal site; evaluation of the existing ground water pumping and treatment system and implementation of any necessary modifications to improve the operation; continued ground water monitoring; and implementation of deed and ground water use restrictions. The estimated present worth cost for the selected remedy is $2,448,000 which includes an annual O&M cost of $576,000.

PERFORMANCE STANDARDS OR GOALS: The ground water remediation goals are based on State primary drinking water standards (PDWS) or PMCLs. Chemical-specific goals were provided for nine chemicals of concern including benzene 1 ug/l (PDWS) and toluene 2,000 ug/l (PMCL).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to restrict ground water use onsite and within a reasonable distance of the site.

KEYWORDS: Air Stripping; Benzene; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; O&M; Onsite Discharge; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Xylenes.

RECORDS OF DECISION ABSTRACTS
REGION V
(Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)

ADRIAN MUNICIPAL WELL FIELD, MN
First Remedial Action - Final
September 29, 1989

The Adrian Municipal Well Field site is in Adrian, Nobles County, Minnesota, a city which relies solely on ground water for its municipal water supply. In 1983 the State detected VOC contamination in two of the six wells at the site, and by 1985 the city had replaced the VOC-contaminated wells with two new wells. Subsequent ground water sampling indicated that petroleum releases from underground storage tanks (UST) are sources for soil and ground water contamination. Although ground water contaminant concentrations exceed Federal and State drinking water and surface water standards, no further action will be taken by the Superfund program because the program does not have the authority to address clean up of petroleum releases. EPA will, however, formally transfer the site to its UST program in October 1989 for further action. There are no costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No further action.

ALSCO ANACONDA, OH
First Remedial Action
September 8, 1989

The Alsco Anaconda site is a 4.8-acre former sludge disposal area in Gnadenhutten, Tuscarawas County, Ohio. The site lies within the Tuscarawas River's 50- and 100-year floodplains and neighbors the Alsco Anaconda aluminum manufacturing plant which has operated since 1948. Contamination at the site occurred from 1965 to 1978 when wastewater and wastewater treatment sludge from the plant, containing hazardous aluminum processing wastes (FO19), was disposed of in an unlined settling basin and a sludge pit. In 1978 the plant owners began dewatering the treatment sludge prior to disposal of sludge offsite in the settling basin and a former swamp area. This ROD is the first of two operable units at the site and addresses remediation of the contaminated soil and sludge. Because leachate from the sludge may have contaminated the ground water and surface water, a subsequent ROD will address the appropriate remedial action for those media. The primary contaminants of concern affecting the soil and sludge are organics including PCBs, and metals including chromium, cyanide, and arsenic.

The selected remedial action for this site includes excavating 50 cubic yards of sludge contaminated with greater than 500 mg/kg of PCBs followed by offsite incineration and disposal; excavating 8,820 cubic yards of aluminum processing waste sludge and underlying soil from the settling basin and sludge pit contaminated with less than 500 mg/kg of PCBs followed by offsite treatment and disposal or reuse; backfilling and revegetating excavated areas; and implementing institutional controls including site access and deed restrictions. The estimated capital cost for this remedial action is $4,161,066 with no associated O&M costs.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup goals will meet clean closure levels which require soil and sludge to be excavated until remaining soil contaminant concentrations attain a cumulative excess cancer-risk level below 10^{-4} and a cumulative hazard index value of less than one for critical effect. Chemical-specific cleanup goals were not specified but will be established during the remedial design.

INSTITUTIONAL CONTROLS: Site access and deed restrictions will implemented.

KEYWORDS: Arsenic; Carcinogenic Compounds; Chromium; Clean Closure; Direct Contact; Excavation; Filling; Floodplain; Incineration; Institutional Controls; MCLs; Metals; Offsite Disposal; Offsite Treatment; Organics; PCBs; RCRA; Safe Drinking Water Act; Sludge; Soil; Stabilization/Solidification; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology.

AUTO ION CHEMICALS, MI
First Remedial Action
September 27, 1989

Auto Ion Chemicals site is a former plating waste treatment and disposal facility occupying approximately 1.5 acres of vacant, fenced land in Kalamazoo, Michigan. The site is bounded to the north, east, and west by commercial/industrial facilities and lies adjacent to and within the floodplain of the Kalamazoo River. Ground water at the site is not currently used as a source of drinking water. From 1964 to 1973 the facility received chrome and cyanide plating waste. Heavy metals were precipitated from the plating waste and deposited in an onsite lagoon, and wastewater was discharged to the sanitary sewer. Leaks and spills from storage tanks, lagoon seepage, and other site activities resulted in soil contamination. In 1983 EPA conducted an emergency surface removal and, in 1986, they demolished the site structures which housed tanks and storage facilities. This first operable unit represents a source control remedial action for the soil. A second operable unit will address ground water contamination. The primary contaminants of concern affecting the soil are organics including PAHs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavation and offsite stabilization of approximately 7,200 cubic yards of contaminated soil; offsite disposal of treated soil in an approved land disposal area; and replacement of the excavated soil with clean fill. The estimated capital cost for this remedial action is $3,332,988, with an estimated annual O&M cost of $5,900.

PERFORMANCE STANDARDS OR GOALS: Soil posing a carcinogenic health risk greater than 10^{-6} will be excavated and treated to meet RCRA land disposal restrictions for soil contaminated with F006 waste. The treated soil must pass the TCLP test prior to offsite land disposal. Chemical-specific contaminant goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Carcinogenic Compounds; Chromium; Closure Requirements; Direct Contact; Excavation; Filling; Floodplain; Leachability Tests; Lead; Metals; Offsite Disposal; Offsite Treatment; O&M; Organics; PAHs; RCRA; Soil; Solidification/Stabilization; State Standards/Regulations.

BIG D CAMPGROUND, OH
First Remedial Action - Final
September 29, 1989

The Big D Campground site is in Kingsville, Ashtablua County, Ohio. The site consists of a 1.2-acre landfill created out of a former sand and gravel quarry. From 1964 to 1976 the site owner accepted approximately 28,000 cubic yards of hazardous materials for disposal which included up to 5,000 drums containing solvents, caustics, and oily substances. A 1986 remedial investigation identified the landfill as the primary source of contamination in soil outside the landfill and ground water underlying the landfill. Ground water contamination is of significant concern because it is migrating towards the drinking water supply wells of nearby residences and Conneaut Creek which is adjacent to and south of the site. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE and TCE; other organics; and metals including chromium and lead.

The selected remedial action for this site includes removing and incinerating up to 5,000 buried drums, bulk wastes, and up to 30,000 cubic yards of contaminated soil followed by onsite disposal of nonhazardous ash residue; pumping and treatment of 40,000,000 to 60,000,000 gallons of ground water using an onsite granular activated carbon system followed by onsite discharge to

Conneaut Creek; and ground water and surface water monitoring. The estimated present worth cost for this remedial action is $39,000,000, which includes annual O&M costs of $320,000.

PERFORMANCE STANDARDS OR GOALS: This remedial action will reduce health risks identified in the ground water to a cumulative hazard index of 1.0 or less and a cumulative carcinogenic risk of 10^{-6} or less. Ground water cleanup goals are based on MCLs and include TCE 5 ug/l and chromium 50 ug/l.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Monitoring; TCE; Treatability Studies; Treatment Technology; VOCs.

BOWERS LANDFILL, OH
First Remedial Action - Final
March 24, 1989

The 12-acre Bowers Landfill site is in rural Pickaway County, Ohio, within the Scioto River floodplain. Fifteen residences lie within a 0.5-mile radius of the site. Information on the types and quantities of waste disposed of at the site is not readily available; however, landfill operations, which started in 1958, consisted solely of municipal refuse disposal until 1963. From 1963 to 1968, however, industrial refuse and chemical wastes were also disposed of at the site. Operations ended in 1968. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs including PCE and benzene; other organics including PAHs and PCBs; metals including lead and chromium; and other inorganics.

The selected remedial action for this site includes removal of surface vegetation and debris such as domestic waste and drums followed by offsite disposal at a hazardous waste landfill or solid waste landfill if wastes are determined to be nonhazardous; erosion controls including surface regrading in areas prone to flooding and erosion; excavation and dewatering of drainage ditch sediment followed by onsite disposal; replacement of the discharge pipe; construction of a soil and clay cap with quarterly inspections for leachate and gas formation; implementation of site access and ground water use restrictions; and ground water monitoring. The estimated present worth cost for this remedial action is $4,300,000, which includes annual O&M costs of $116,000.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals were not provided; however, cleanup levels will be based on MCLs where available and a 10^{-6} cancer risk for all other contaminants.

INSTITUTIONAL CONTROLS: Site access and ground water use restrictions will be implemented at the site.

KEYWORDS: Benzene; Capping; Carcinogenic Compounds; Chromium; Debris; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Disposal; Organics; PAHs; PCE; Plume Management; Public Exposure; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; VOCs.

BYRON SALVAGE YARD, IL
Third Remedial Action
June 30, 1989

The Byron Salvage Yard site is in rural Ogle County, Illinois and is approximately 3 miles southwest of the city of Byron. The site, which includes the Byron Salvage Yard and Dirk's Farm, is bordered by a forest preserve district to the north, an operating nuclear plant to the southeast, residential property to the south, and an open field to the west. The site is bisected by two 15 to 30 feet deep ravines draining surface water runoff through the ravine waterways to the south branch of Woodland Creek, which flows to the Rock River. During the 1960s the salvage yard owner accepted miscellaneous wastes and debris for disposal including drums of electroplating wastes, oil sludges, cutting wheels, solvents, and scrap metal. Industrial waste dumping reportedly occurred on the site during periods of heavy rainfall so that most of the waste would be carried offsite by the resulting surface water runoff. In 1976 the Illinois EPA documented the presence of cyanide and heavy metals in soil, surface water, and ground water in and around the site. In 1986 the State initiated cleanup activities which included excavating buried drums from the ravines; removing surface drums; excavating soil heavily contaminated by heavy metals or organics; and excavating soil with concentrations 100 mg/kg or greater of cyanide. In-situ treatment of cyanide- contaminated soil less than 100 mg/kg was performed but low levels of cyanide still remain. Water quality sampling, performed in 1984, revealed that offsite ground water was contaminated with VOCs, primarily TCE. The two aquifers which underlie and surround the site contain elevated levels of VOCs, metals, and cyanide. Private residential water supply wells that were affected by the contaminated ground water were temporarily supplied with bottled drinking water. In 1986 an EPA-approved emergency action led to the installation of in-house carbon filtration units at ten residences in the Rock River Terrace subdivision located a 1/2 mile northwest of the site. A 1986 State ROD extended the municipal water supply system from Byron to the Rock River Terrace subdivision. This operable unit addresses the ground water contamination emanating from the site and is the third of four operable units. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, and TCE; metals including arsenic, chromium, and lead; and other inorganics including cyanide.

The selected remedial action for this site includes removing all wastes generated during the remedial investigation; adding a one-foot soil cover to the affected portions of the site and regrading and revegetating the new surface; monitoring surface and ground water; plugging and abandoning monitoring wells no longer in use; providing an alternate source of drinking water by extending the water main of the municipal system to 27 additional residences; and implementing institutional controls. The estimated present worth cost is $1,100,000, which includes annual O&M costs of $16,000.

PERFORMANCE STANDARDS OR GOALS: Because an alternate water supply will be provided, MCLs for ground water contaminants will not be exceeded at the tap for affected residents. In lieu of MCLs, EPA is establishing cleanup levels based on alternate concentration limits (ACLs) which will be set at contaminant concentrations currently found in the aquifers. Maximum concentration limits, for Ambient Water Quality Criteria and/or State Water Quality Standards, will be attained in a nearby pond and river.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to preclude future use of the ground water in undeveloped areas where the ground water is contaminated due to the site. These controls may include deed restrictions or mandatory hookups to public water supplies, plugging and abandoning residential wells, and/or other such actions.

KEYWORDS: ACL; Alternate Water Supply; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; PCE; Public Exposure; RCRA; State Permit; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria.

CEMETERY DUMP, MI

Second Remedial Action - Final

September 29, 1989

The 4-acre Cemetery Dump site is a former sand and gravel pit in Rose Township, Oakland County, Michigan. During the late 1960s or early 1970s, approximately 300 to 600 drums, containing paint sludges, solvents, PCBs, and oils, were illegally dumped and buried onsite. A 1985 ROD addressed the soil cleanup which included excavation and offsite disposal of visually-contaminated soil and drum fragments. Soil which was not visually contaminated was sampled and backfilled with clean soil into the excavated areas. Subsequent soil and ground water sampling indicated that zinc contaminants in the ground water exceed the Federal secondary MCL, a nonenforceable standard based on taste and odor, not protection of health. Zinc contamination, however, is most likely a result of monitoring well construction materials. No other contaminants exceed Federal or State environmental standards.

The selected remedial action for this site is no further action because previous remedial activities appear to provide adequate protection to human health and the environment. Ground water will be monitored annually, and a 5-year review will be performed to ensure that the site continues to pose no threat to human health and the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

CLIFFS/DOW DUMP, MI
First Remedial Action - Final
September 27, 1989

The municipally owned 2-acre Cliffs/Dow Dump site is in a wooded recreational area adjacent to the Dead River in Marquette, Michigan. From 1954 until the early 1960s wastes generated by the Cliffs-Dow Chemical Company's charcoal manufacturing plant were deposited at the site. The wastes, which included tar and tar-contaminated fill materials, were deposited to fill a small bog depression. The 200 cubic yards of exposed tar deposits are the primary source of contamination in the soil; however, the remaining 9,400 cubic yards of fill material containing charcoal and wood intermingled with approximately 200 cubic yards of tar, are also a contamination source. Results of pilot studies indicate that ground water is undergoing in-situ biodegradation as it flows downgradient of the fill and poses no risk to human health or the environment. The primary contaminants of concern affecting the soil are VOCs including benzene, toluene, PCE, and xylenes; and other organics including PAHs and phenol.

The selected remedial action for this site includes excavation and offsite incineration of 200 cubic yards of exposed tars; excavation of 9,400 cubic yards of fill material intermingled with tars, and segregation followed by offsite incineration of 200 cubic yards of buried tars encountered during the excavation; forced aeration biological treatment of the 9,200 cubic yards of residual contaminated fill material after replacement in the excavated area; installing a soil cover and revegetation of bioremediated fill area; implementation of institutional controls including deed restrictions preventing new well installation and disturbance of fill material until health-based goals have been achieved; and ground water and air monitoring. The estimated present worth cost for this remedial action is $2,842,165, which includes estimated annual O&M costs of $63,280.

PERFORMANCE STANDARDS OR GOALS: Ground water contaminant levels, which are already below levels of concern, will further decrease through biodegradation and natural attenuation once the source material is removed. EPA's Superfund Public Health Evaluation Manual was used to develop health-based goals for source areas; however, no chemical-specific goals were provided.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent the future use of ground water, including the establishment of drinking water wells within the vicinity of the contaminated ground water boundaries, and will also prohibit disturbances of the fill materials during the biological treatment process until health-based goals have been achieved.

KEYWORDS: Acids; Air Monitoring; Benzene; Biodegradation/Land Application; Carcinogenic Compounds; Clean Air Act; Closure Requirements; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; MCLs; Offsite Treatment; O&M; Onsite

Disposal; Onsite Treatment; Organics; PAHs; PCE; Phenols; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

CROSS BROTHERS PAIL (PEMBROKE), IL

First Remedial Action - Final

September 28, 1989

The Cross Brothers Pail site is a former pail and drum recycling operation located in Pembroke Township, Kankakee County, Illinois. The 20-acre site, approximately half of which was used for waste disposal, is in a semi- residential area interspersed with small farms. Recycling operations, which involved draining empty drums and pails containing paints, dyes, and inks onto the ground, resulted in the formation of a waste residue layer approximately 6 inches thick over 10 acres of the property. In addition crushed pails and drums were buried in 10 trenches located around the site. Operations continued at the site from 1961 until 1980 when the State closed the site and ordered a cleanup. An Initial Remedial Measure was signed in 1985 which required clearing the disposal area of all vegetation and removing 6,438 tons of contaminated surficial soil, 542 drums containing wastes, and 572 empty drums. From 1986 to 1989 the State conducted additional studies to define the nature and extent of ground water and residual soil contamination. The site can be divided into two areas: a 6.5-acre area characterized by small local areas of soil contamination and a 3.5-acre area that contains contamination throughout the unsaturated zone (approximately 33,800 cubic yards of soil). Ground water contamination is the principal threat at the site. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; and other organics including PCBs.

The selected remedial action for this site has been divided into two operable units. The first involves resampling a localized PCB-contaminated soil area followed by excavation and offsite incineration of approximately 5 cubic yards (dependent upon resampling results) of soil with a PCB level exceeding 10 mg/kg/. The second operable unit addresses ground water and soil remediation. The 6.5-acre area will be covered with a 6-inch vegetative cover, and the 3.5-acre area will be covered by 6 inches of gravel. Ground water will be pumped and treated onsite with discharge onto the 3.5-acre gravel area via an irrigation system, thus establishing a "cleansing loop" and inducing soil flushing through the area of VOC contamination. Deed and access restrictions will be implemented. The estimated present worth cost for this remedial action is $2,076,500, which includes an annual O&M cost of $59,235 for 15 years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will meet currently promulgated MCLs, a cumulative excess lifetime cancer risk not exceeding 10^{-6}, and a hazard index ratio less than or equal to 1. No chemical-specific ground water cleanup goals were provided. PCB-contaminated soil will be excavated such that a level less than 10 mg/kg (based on TSCA Spill Policy) remains onsite.

INSTITUTIONAL CONTROLS: The site will be secured through the installation of fencing and the initiation of a deed notification requirement identifying EPA and State concerns regarding activities at the site.

KEYWORDS: Benzene; Carcinogenic Compounds; Clean Air Act; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PCBs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; State Guidance; State Permit; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Xylenes.

E.H. SCHILLING LANDFILL, OH

First Remedial Action - Final

September 29, 1989

The E.H. Schilling Landfill site is in Hamilton Township, Lawrence County, Ohio. The site is a 2.7-acre landfill on a larger tract of land. The predominantly rural area neighboring the site includes approximately 50 residences, which are between 0.25 mile and 1.5 miles from the site. The landfill was created by constructing a dam across a small valley. Both the landfill cover and dam have been described as inadequate, and leachate containing hazardous substances is being released through and beneath the dam. From 1969 to 1980 the landfill operators accepted both nonhazardous and hazardous wastes including styrene, phenol, acetone, alcohol, wastewater treatment sludge, coal tar compounds, and cumene. Results from a 1988 investigation reveal that soil and sediment contamination is limited to the area immediately adjacent to the dam, and ground water contamination is limited to the monitoring wells immediately surrounding the landfill and the monitoring wells downgradient of the dam. Contamination appears to be due to leachate runoff. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene; other organics including PAHs, pesticides, and phenol; and metals including arsenic.

The selected remedial action for this site includes excavation of 500 cubic yards of sediment and 750 cubic yards of surface soil for consolidation in the landfill; construction of a 2.7-acre RCRA cap to contain 100,000 cubic yards of landfill waste; construction of a clay berm to improve dam stability; construction of a perimeter cut-off wall to eliminate the lateral flow of ground water into the landfill waste; construction of an interceptor drain outside the cut-off wall to drain ground water away from the landfill; dewatering the landfill of 7,000,000 gallons of leachate and treating the leachate using air stripping, and carbon adsorption to remove organics and sulfide precipitation to remove inorganics, followed by discharge to surface water; treatment and discharge of an additional 1,000,000 gallons of wastewater generated during the remedial action; ground water monitoring; and implementation of access and institutional controls. The estimated capital cost for this remedial action is $6,444,000, with an estimated annual O&M cost of $99,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil will be excavated and consolidated to achieve a cumulative risk of less than 10^{-6} carcinogenic risk and a cumulative noncarcinogenic hazard index less than or equal to 1. Ground water will be treated if it exceeds action levels which have been established as a cumulative cancer risk of less than 10^{-6} and a cumulative noncarcinogenic hazard index less than or equal to 1.

INSTITUTIONAL CONTROLS: Institutional controls include site access and deed restrictions.

KEYWORDS: ACL; Air Stripping, ARAR Waiver; Arsenic; Benzene; Capping; Carbon Adsorption; Carcinogenic Compounds; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Sediment; Slurry Wall; Soil; State Standards/Regulations; Treatment Technology; VOCs.

GALESBURG/KOPPERS, IL

First Remedial Action - Final
June 30, 1989

The Galesburg/Koppers site is a 105-acre area located approximately two miles south of the city of Galesburg in Knox County, Illinois. The land surrounding the site is sparsely populated with the Burlington Northern Railroad yard to the north, a landfill to the east, and four residences and a lumber yard to the south and west. Farmland abuts these areas. Burlington Northern Railroad Company operated the site as a railroad tie treating plant from 1907 to December 1966. In 1966 the Koppers Company, Inc. leased the production plant from Burlington Northern and resumed operation of the facility. Treatment operations consisted of pressure treatment of the railroad ties using a mixture of creosote and coal tar or creosote and fuel oil. From 1971 to 1976 pentachlorophenol (PCP) was used in the treatment process. Key contaminated areas at the site include a slurry pond, a northern and southern creosote lagoon, a PCP-contaminated lagoon, a waste pile storage area, two backfilled drainage ditches, and two former spray wastewater fields. Contamination has been found in soil, ground water, surface water, and on- and offsite sediment. This ROD addresses all contaminated media. These actions, in combination with remedial actions at the Steagall Landfill site, are intended to eliminate offsite surface water and sediment contamination as well. The primary contaminants of concern affecting the soil and ground water are organics including PCP, phenols, and PAHs.

The selected remedial action for this site includes excavation and onsite consolidation of approximately 15,200 cubic yards of contaminated soil with onsite biological treatment of soil and implementation of a biological monitoring program; construction of shallow ground water interceptor trenches and deep pumping wells with pumping and onsite pretreatment of shallow and deep ground water using an existing wastewater treatment system to achieve cleanup objectives, discharging treated ground water to a POTW for final treatment or onsite treatment should the POTW pretreatment standards not be achieved; ground water monitoring; and implemention of site access and land use restrictions. The estimated present worth cost for this remedial action is $4,286,844, which includes an estimated annual O&M cost of $170,012.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific cleanup goals were established for soil at the site. The soil will be excavated six inches beyond visible contamination. Samples will be taken after excavation to assess the mitigative efforts and to confirm remediation to health-based levels. Additionally, soil will be treated to background toxicity levels. Cleanup goals for ground water were based on a 10^{-6} excess carcinogenic risk goal.

INSTITUTIONAL CONTROLS: Site access and land use restrictions will be implemented for the area of contamination in accordance with the anticipated consent decree.

KEYWORDS: Aeration; ARAR Waiver; Biodegradation/Land Application; Carcinogenic Compounds; Clean Water Act; Dioxin; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Hybrid/Alternate Closure (not under RCRA); O&M; Offsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; Plume Management; Public Exposure; Publicly Owned Treatment Works (POTW); RCRA; Soil; State Guidance; Treatability Studies; Treatment Technology.

HEDBLUM INDUSTRIES, MI
First Remedial Action - Final
September 29, 1989

The Hedblum Industries site, an automotive parts manufacturing plant, is approximately one mile southwest of the town of Oscoda, in AuSable Township, Iosco County, Michigan. In addition to the plant, the site consists of a ten-acre industrial park, a wetland area, and residences including the AuSable Heights subdivision. Ground water flows beneath the plant and subdivision and discharges via a bayou into the AuSable River. Between 1968 and 1972 the previous plant operators discharged cooling water, rinse water, and approximately 4,000 gallons of waste TCE onto the ground. In 1973 VOCs were detected in residential wells in the AuSable subdivision. Contaminated wells were replaced with deeper wells which by 1977 also showed traces of contamination. Subsequently, the Oscoda Township Municipal Supply System was extended to residents through the installation of a new water main. An underground storage tank containing TCE, TCA, and PCE was removed from the site in 1980. The primary contaminants of concern affecting the ground water are VOCs including benzene, toluene, xylenes, TCE, and PCE; and metals including lead.

The selected remedial action for this site includes ground water pumping and treatment using activated carbon adsorption with discharge to the bayou; and ground water and soil monitoring. The estimated present worth cost for this remedial action is $1,379,000, which includes an annual O&M cost of $264,000 over 4 to 5 years.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet SDWA MCLs. Target cleanup levels for ground water include benzene 5 ug/l, TCE 5 ug/l, and lead 50 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water

Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; Offsite Discharge; Onsite Treatment; O&M; PCE; Plume Management; Safe Drinking Water Act; State Permit; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Wetlands; Xylenes.

INDUSTRIAL EXCESS LANDFILL, OH

Second Remedial Action - Final
July 17, 1989

The 30-acre Industrial Excess Landfill site is in Uniontown, Stark County, Ohio. Several hundred residences are within a half mile of the site, and all residences and businesses in the Uniontown area rely on ground water from private well supplies. Surface water at the site flows to Metzger Ditch which is located along the eastern border of the site. The site was operated as a mixed industrial and residential landfill from 1966 until 1980. Large amounts of fly ash and liquid wastes including latex and spent organic solvents were disposed of in the landfill between 1968 and 1972. To prevent the spread of contaminants associated with these wastes, several emergency actions have been undertaken. In 1986 an active methane extraction system was installed to prevent the offsite migration of explosive levels of methane gas. In April 1987 EPA installed air strippers in eight residences and two businesses due to the presence of low levels of volatile organic compounds. In September 1987 EPA signed a ROD to provide an alternate water supply to 100 homes west of the site to ensure that the community received safe drinking water while the final remedial action for the site was implemented. This ROD represents the final remedial action for the site and addresses the source area, gases generated within the source area, and contaminated ground water.

The selected remedial action for this site includes installing a multilayer RCRA cap over the site to prevent surface water infiltration; expanding the existing methane venting system to accommodate the potential increase of landfill gas due to the cap; extracting and treating approximately 256 million gallons of contaminated ground water by air stripping, carbon adsorption, and flocculation/sedimentation/filtration to achieve compliance with Clean Water Act NPDES discharge criteria for surface water discharge; continuing the pumping of ground water to maintain a lowered water table and protect ground water from additional contamination by the landfill; treating surface water from ponds at the site, if necessary; and dredging contaminated sediment from the ponds and ditch and incorporating them under the cap; multimedia monitoring; and institutional controls restricting future use of the site. The estimated present worth cost for this selected remedial action is $18,548,000, which includes an estimated annual O&M cost of $440,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will ensure that landfill gas concentrations beyond the site boundary will not exceed 5 percent methane. Ground water cleanup is based on a 10^{-6} excess cancer level and will be treated to achieve MCLs in the aquifer and discharged in compliance with Clean Water Act NPDES requirements. Specific ground water goals include benzene 5 ug/l and vinyl chloride 2 ug/l. Permit limits are established in accordance with State EPA Aquatic Life Quality Criteria for discharge to Metzger Ditch. Acute and chronic limits for the ditch discharge were provided in the ROD.

INSTITUTIONAL CONTROLS: Institutional controls will be imposed to restrict future use of the site property. Future construction or public use of the land will be prohibited.

KEYWORDS: Air; Air Monitoring; Air Stripping; Benzene; Capping; Carbon Adsorption; Clean Air Act; Clean Water Act; Dredging; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; MCLs; Metals; Offsite Discharge; Onsite Treatment; O&M; Organics; PAHs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; VOCs; Water Quality Criteria.

IONIA CITY LANDFILL, MI

First Remedial Action
September 29, 1989

The Ionia City Landfill site is a 20-acre municipally owned landfill in the southeast corner of Ionia, Michigan. The site is bordered by the Grand River to the south, a tributary to the Grand River to the east, and a light commercial/residential area to the north. The site lies within the 100-year floodplain of the Grand River. The landfill was operated from the 1950s until about 1969, during which time industrial, commercial, and municipal wastes were disposed of at the site, including drummed liquids and solids from industrial sources. Drums of ignitable liquid wastes were reportedly burned until 1965. A State investigation in 1981 revealed exposed drums containing paint wastes, thinners, and industrial solvents as well as elevated levels of metals. Furthermore VOC- and metal-contaminated ground water was detected. EPA investigations began in 1982 and revealed VOC contamination in the Grand River tributary surface water. Follow-up investigations by EPA led to an immediate removal action in 1984-85 by the city, under an administrative order, which included fencing a portion of the site, removing and disposing of exposed drums, covering depressed areas, and stabilizing areas of erosion. Current site risks result from subsurface wastes (or point source) from a 1/4 acre area in the northern section of the landfill. The estimated total waste volume is 5,000 cubic yards consisting of badly deteriorated buried drums and associated wastes, and contaminated soil. In addition there is a contaminant plume in an underlying shallow aquifer. The first operable unit addresses the point source area. A second operable unit addressing ground water has been deferred until the completion of the ground water monitoring plan. The primary contaminants of concern affecting the soil and debris are VOCs including vinyl chloride and methyl chloride; other organics; and metals including chromium.

The selected remedial action for this site includes in-situ vitrification of the defined point source area and an adjacent margin of safety zone, including an off-gas collection and treatment system; access restrictions; ground water monitoring; institutional controls to restrict site use; and upgrading the landfill cover and repairing the side slopes followed by revegetation. The estimated present worth cost for this remedial action is $3,630,525, which includes an estimated annual O&M cost of $112,750 for year 1 and $51,000 for years 2-10. If a pilot test indicates that the selected remedy is inadequate, a contingency alternative of partial excavation with onsite incineration will be implemented.

PERFORMANCE STANDARDS OR GOALS: Target cleanup levels for the soil-refuse matrix to determine the extent of excavation will not be established; instead, the extent of excavation will be based on the extent of buried drums and additional sampling.

INSTITUTIONAL CONTROLS: Site use restrictions will be implemented.

KEYWORDS: Carcinogenic Compounds; Chromium; Clean Air Act; Closure Requirements; Debris; Contingency Remedy; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Institutional Controls; Metals; Municipally Owned Site; O&M; Onsite Treatment; Organics; RCRA; Soil; Solvents; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs.

KYSOR INDUSTRIAL, MI

First Remedial Action - Final
September 29, 1989

The Kysor Industrial site is a large truck parts manufacturing plant in the Cadillac industrial park in the city of Cadillac, Wexford County, Michigan. Approximately 40 industries operate in the 1-square-mile industrial park including Northernaire, another Superfund site. The Northernaire site will be addressed by the ground water remediation portion of this action as well. There are several private residences including a trailer park within the industrial park, and another residential neighborhood lies adjacent to the northern boundary of the park. The city of Cadillac water supply well field is located near the center of the park, and ground water beneath the site generally flows towards the city wells. The Clam River flows through the southeast portion of the site draining runoff from the site.

The Kysor facility commonly uses solvent cleaners and degreasers; past disposal practices included dumping barrels of spent solvent directly on the soil behind the plant. Kysor excavated approximately 700 cubic yards of soil in 1981 after contaminants were discovered in ground water samples. Ground water contamination has since been detected throughout the shallow and intermediate aquifers underlying the park. At present the deep aquifer (in which the Cadillac city well field is located) is not affected by this contamination. The remaining soil contamination is relatively localized and is from 6 to 25 feet in depth. The primary contaminants of concern affecting the soil and ground water are VOCs including toluene, TCE, PCE, and xylenes; and metals including chromium.

The selected remedial action for this site includes a two-stage ground water pumping and treatment system using carbon adsorption for the removal of chromium and air stripping with vapor-phase carbon adsorption for the removal of VOCs and discharge to the Clam River; in- situ soil vacuum extraction with air pollution control equipment; ground water monitoring; and institutional controls including site access and ground water and land use restrictions. The estimated present worth cost for this remedial action is $16,000,000, which includes present worth O&M costs of $5,000,000 over 60 years.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet or exceed State and SDWA MCL standards. Target cleanup levels for ground water include xylene 440 ug/l, toluene 40 ug/l, PCE 1 ug/l, TCE 5 ug/l, and chromium (hexavalent) 50 ug/l. Soil will meet State, RCRA, and CAA standards. Target cleanup levels for soil include xylene 141 mg/kg, toluene 724 mg/kg, and TCE 0.07 mg/kg.

INSTITUTIONAL CONTROLS: Institutional controls will be established including site access and ground water and land use restrictions.

KEYWORDS: Air Stripping; Carbon Adsorption; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Drinking Water Contaminants; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Metals; Offsite Discharge; O&M; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; State Permit; State Standards/Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Xylenes.

LASKIN/POPLAR OIL, OH

Third Remedial Action - Final

June 29, 1989

The 9-acre Laskin/Poplar Oil site is in Jefferson Township, Ashtabula County, Ohio. Included on the site are: a residence, a greenhouse complex, a boiler house/garage containing 4 boilers, a smokestack, 4 oil storage pits, 1 underground and 32 above ground oil storage tanks, a retention pond, a freshwater pond, and miscellaneous small buildings. In the 1960s storage pits and tanks were installed to store waste oil for the boilers that heated the greenhouses. The Poplar Oil Company continued to accept the waste oil throughout the 1960s and 1970s. In 1981 EPA found PCBs in onsite ground water and soil which resulted in several emergency actions that included draining and regrading 2 retention ponds, diverting surface runoff to other retention ponds, removing offsite and incinerating 302,000 gallons of waste oil, treating and discharging offsite 430,000 gallons of contaminated surface water, and solidifying 205,000 gallons of sludge. From 1985 to 1986 the Poplar Oil Company removed an additional 250,000 gallons of waste oil and wastewater in response to an administrative order. Two additional orders were issued ordering workplan development and incineration of materials in the pits, tanks, and heavily contaminated soil. The primary contaminants of concern affecting the soil, onsite structures, and debris are organics including PCBs, PAHs, pesticides, and dioxin; and metals including lead.

The selected remedial action for this site includes draining onsite freshwater and retention ponds with offsite discharge and refilling; thermally treating contaminated soil, ash, and debris from the boiler house area with onsite disposal of ash if the ash can be delisted, otherwise offsite disposal in a RCRA landfill; demolishing and thermally treating or decontaminating dioxin-contaminated structures; constructing an up-gradient ground water diversion trench; installing a multi-layer cap over contaminated soil exceeding a 10^{-6} excess cancer-risk level; monitoring surface and ground water; and imposing access and land use restrictions. The estimated present worth cost for this remedial action is $11,000,000, which includes present worth O&M costs of $1,000,000.

PERFORMANCE STANDARDS OR GOALS: No specific cleanup goals were provided; however, remediation goals will prevent exposure to contaminated soil and debris exceeding a 10^{-6} cancer-risk level or a total hazard index greater than 1.

INSTITUTIONAL CONTROLS: Land use and access restrictions will be implemented to prohibit site use, land development, and ground water extraction.

KEYWORDS: Capping; Clean Air Act; Clean Water Act; Debris; Decontamination; Dioxin; Direct Contact; Filling; Floodplain; Ground Water; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Landfill Closure; Lead; Metals; Offsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs, PCBs; Pesticides; RCRA; Soil; State Standards/Regulations; Surface Water; Surface Water Monitoring; Treatment Technology.

MIDCO I, IN
First Remedial Action - Final
June 30, 1989

The MIDCO I site is a four-acre, abandoned industrial waste recycling, storage, and disposal facility in Gary, Indiana. The surrounding area is partially rural, including wetlands. Residential neighborhoods lie to the west, south, and east, with some residents living as close as 900 feet from the site. Twelve drinking water wells have been identified within approximately one mile of the site. The Calumet Aquifer, one of the two major aquifers underlying the site and providing water to these wells, is highly susceptible to contamination from surface sources. Recycling, storing, and disposing of industrial wastes began at the site sometime before June 1973. Within a three-year period, the site owners accepted and stockpiled approximately 6,000-7,000 55-gallon drums containing bulk liquid waste, and 4 bulk tanks, each 4,000-10,000 gallons. The facility closed in December 1976 after a fire burned approximately 14,000 drums of chemical waste. Operations resumed in October 1977 under new ownership. By February 1979 the new owners abandoned the facility, leaving thousands of drums and waste chemicals unattended. By January 1980 an estimated 14,000 drums were still stockpiled onsite. In June 1981 severe flooding caused water in the area to drain west into a neighboring city; contact with the flood water reportedly resulted in skin burns. In 1982 EPA initiated a surface removal action which included removing extensive surface wastes, an underground tank, and the top one foot of contaminated soil. Because these activities did not address the contaminated subsurface soil, sediment, and ground water, EPA has initiated this first remedial action to address the above-referenced contaminated media. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, toluene, and TCE; other organics including PCBs, phenols, and PAHs; and metals including chromium and lead.

The selected remedial action for this site includes soil vapor extraction followed by treatment of 12,400 cubic yards of contaminated soil and subsurface materials using solidification/stabilization and onsite disposal; excavation and onsite solidification/stabilization of approximately 1,200 cubic yards of contaminated sediment in surrounding wetlands; covering the site in accordance with RCRA landfill closure requirements; ground water pumping and deep well injection in a Class I well if EPA grants a petition to allow land disposal of waste prohibited under RCRA; if a petition is not approved, ground water will be treated using air stripping and a liquid-phase granular activated carbon polish system to meet EPA requirements (LDR treatment standards), followed by deep well injection or reinjection into the aquifer; ground water monitoring; and implementation of deed and access restrictions. The estimated present worth cost for this remedial action is $13,989,000, which includes annual O&M costs of $525,000, if ground water is treated; or $10,728,000, which includes annual O&M costs of $188,000, if ground water is not treated.

PERFORMANCE STANDARDS OR GOALS: Cleanup action levels were provided for soil and ground water. Soil and sediment will be treated if they exceed any of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-6}; cumulative chronic noncarcinogenic index equal to 1.0; or subchronic risk index equal to 1.0. Ground water will be pumped and treated if it exceeds any of the following risk-based levels: cumulative lifetime cancer risk equal to 10^{-5}; cumulative noncarcinogenic index equal to 1.0; subchronic risk equal to 1.0; primary MCLs; or chronic AWQC (for aquatic wildlife) multiplied by a dilution factor of 3.9. If only one constituent poses a cancer risk equal to or greater than 10^{-5}, the MCL, if promulgated, will be the cleanup action level. Chemical-specific goals were not provided for soil, sediment, or ground water.

INSTITUTIONAL CONTROLS: Institutional controls will include site access and deed restrictions.

KEYWORDS: Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; State Permit; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands; Xylenes.

MIDCO II, IN
First Remedial Action - Final
June 30, 1989

The MIDCO II site is a seven-acre storage and disposal facility in Gary, Indiana. The surrounding area is predominantly used for industrial purposes, and includes 34 other potential hazardous waste sites. The underlying aquifer is highly susceptible to contamination from surface sources because of the high water table; however, in the vicinity of the site, the aquifer is used primarily for non-drinking water purposes. The same operator as at another Superfund site, MIDCO I, began waste operations, including drum storage at MIDCO II during the summer of 1976. Following a major fire at the MIDCO I site in January 1977, MIDCO transferred the operations from the MIDCO I site to the MIDCO II site. Operations included temporarily storing bulk liquid and drum wastes; neutralizing acids and caustics; and disposing of wastes by dumping wastes into onsite pits, which allowed wastes to percolate into the ground water. One of these pits, the filter pit, had an overflow pipe leading into a ditch, which drained into the nearby Grand Calument River. By April 1977 approximately 12,000 to 15,000 55-gallon drums of waste materials were stored onsite. Additionally, an estimated ten badly deteriorated and leaking tanks were holding wastes including oils, oil sludges, chlorinated solvents, paint solvents, paint sludges, acids, and spent cyanides. In August 1977 a fire at the site destroyed 50,000 to 60,000 drums. Although most drums were badly damaged, a substantial number of drums, including 75 to 100 drums containing cyanide, survived the fire. EPA conducted a preliminary investigation resulting in the installation of a 10-foot high fence around the site. In 1984 and 1985 EPA conducted emergency removal activities including repairing and extending the site fence; removing most of the remaining drums, tanks, and debris from the site's surface; and removing the sludge pits and filter pit contents. The resulting PCB-contaminated soil pile was removed and disposed of in an offsite hazardous waste landfill in early 1986, and most of the cyanide-contaminated pile was also removed. Removal activities ended in January 1986. The primary contaminants of concern currently affecting the soil, sediment, and ground water are VOCs including benzene, toluene, TCE, and xylenes; other organics including PCBs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavation and treatment of 35,000 cubic yards of contaminated soil and waste materials using solidification/stabilization followed by onsite disposal; excavation and onsite solidification/stabilization of 500 cubic yards of contaminated sediment; covering the site in accordance with RCRA landfill closure requirements; ground water pumping and deep well injection in a Class I well if EPA grants a petition to allow land disposal of waste prohibited under RCRA; if a petition is not approved, ground water will be treated using air stripping and a liquid phase granular activated carbon polish system to meet EPA requirements (LDR treatment standards), followed by deep well injection or reinjection into the aquifer; ground water monitoring; and implementing deed and access restrictions. The ground water treatment and underground injection portions of the remedial action may be combined with the remedial action for MIDCO I. The estimated present worth cost for the remedial action is $18,596,400, which includes annual O&M costs of $733,000, if ground water is treated; or $14,419,000, which includes annual O&M costs of $301,000, if ground water is not treated.

PERFORMANCE STANDARDS OR GOALS: Cleanup action levels were provided for soil, sediment, and ground water. Soil and sediment will be treated if they exceed any of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-5}; cumulative chronic noncarcinogenic index equal to 1.0; or subchronic risk index equal to 1.0. Ground water will be pumped and treated if it exceeds any of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-5}; cumulative noncarcinogenic index equal to 1.0; subchronic risk equal to 1.0; primary MCLs; or chronic AWQC for protection of aquatic life multiplied by a factor of 3.6. If only one constituent poses a cancer risk equal to or greater than 10^{-5}, the MCL, if promulgated, will be the cleanup action level. Chemical-specific goals were not provided for soil, sediment, or ground water.

INSTITUTIONAL CONTROLS: Institutional controls will include site access and deed restrictions.

KEYWORDS: Arsenic; Benzene; Capping, Carcinogenic Compounds; Chromium; Clean Water Act; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; RCRA; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

MIAMI COUNTY INCINERATOR, OH

First Remedial Action - Final
June 30, 1989

The Miami County Incinerator site is in Concord Township, Ohio. The 65-acre site is approximately 1,500 feet west of the Great Miami River; the Eldean Tributory of the river runs across the northwest corner of the site. The site consists of the incinerator building and adjacent property, including a former scrubber wastewater lagoon, an ash disposal pit, an ash pile, a liquid disposal area, and trench and fill landfill areas north and south of the Eldean Tributory. Operations began in 1968, when large quantities of spent solvents, oils, and drummed and bulk industrial sludges were accepted for disposal. The facility generated scrubber wastewater and ash quench water, which were disposed of in the wastewater lagoon. Incinerator fly ash and bottom ash, non-combustible materials, and unburned refuse were disposed of in a landfill north of the tributary, and an estimated 104,000 to 150,000 barrel-equivalents of liquid waste were dumped or buried onsite. After closure of the facility in 1983, the Ohio EPA found detectable levels of chlorinated hydrocarbons in drinking water wells near the site. Three residences, the Miami County Highway Garage, and the incinerator facility were supplied with alternate water supplies in 1986. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, toluene, and TCE; other organics including PCBs, PAHs, dioxin, and pesticides; and metals including lead.

The selected remedial actions for this site are specific to each area of contamination and include excavation and onsite consolidation of ash wastes and contaminated soil onto the landfills with capping of landfills and previously excavated areas; pumping and treatment of ground water with discharge to POTW; vapor/vacuum extraction of liquid disposal area using carbon filters; continued testing of soil, ash, and tributary sediment; and provision of an alternate water supply for area residents and businesses. The estimated present worth for this remedial action is $19,400,000, which includes an estimated O&M cost of $4,666,000.

PERFORMANCE STANDARDS OR GOALS: Specific cleanup levels have not been established at this time; however, they will be based on MCLs, a hazard index of 1, a 10^{-5} cancer-risk level at the waste boundary (i.e., edge of cup), and a 10^{-6} cancer-risk level at the nearest receptor.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented to prevent any future use of ground water.

KEYWORDS: Alternate Water Supply; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Plume Management; Public Exposure; Publicly Owned Treatment Works (POTW); RCRA; Soil; State Standards/Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Volatilization/Soil Aeration.

NEW BRIGHTON/ARDEN HILLS, MN

Fourth Remedial Action (Amendment)
August 11, 1989

The New Brighton/Arden Hills site is an area of organic solvent contamination in ground water northwest of Minneapolis, Minnesota. The site includes the cities of New Brighton, Arden Hills, and St. Anthony as well as the Twin Cities Army Ammunition plant. This ROD amends a June 1986 ROD calling for the installation of a new well to provide part of the drinking water supply to New Brighton. Because of major changes in site conditions, EPA has concluded that a new well is no longer necessary to protect human health in New Brighton. Originally it was anticipated that low contamination levels in Well #7 (one of nine municipal wells) could not be assured and that a replacement well in a deeper aquifer was needed to provide an alternate supply of water. However, further data from Well #7 indicate contamination is not increasing. Moreover, a large water supply will be provided by the U.S. Army to New Brighton as part of a litigation settlement, and a system has been installed by the U.S. Army to prevent further contamination from the suspected sources. Therefore, EPA believes it is no longer necessary or cost effective to complete the project. There are no contaminants of concern affecting the ground water associated with Well #7.

The selected remedial action for this ROD amendment is no further action for the Well #7 operable unit and ceasing the installation of a ground water supply well remedy selected in a June 1986 ROD.

PERFORMANCE STANDARDS OR GOALS: Because the objectives of the operable unit affected was to provide an alternate water supply, rather than cleanup of the site, cleanup standards are not applicable for the amendment.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Municipally Owned Site; ROD Amendment.

NEW BRIGHTON/ARDEN HILLS (TCAAP), MN

Seventh Remedial Action
July 19, 1989

The New Brighton/Arden Hills site, also known as the Twin Cities Army Ammunition Plant (TCAAP) site, is in New Brighton, Minnesota. Land use bordering the four square-mile site is largely residential. Past disposal of ammunition manufacturing wastes onsite resulted in contamination of ground water beneath and downgradient of the site. A total of 14 waste disposal locations have been identified and assigned as Sites A through K. During remedial investigations at Site D, soil was discovered to be contaminated with PCBs and other organic and metal contaminants. A soil gas extraction system was implemented to remove the source of volatile organic contamination and reduce the potential of migration to ground water. In implementing the soil gas extraction system, PCB- contaminated soil was removed, stockpiled near Site D, and sealed with a plastic liner material. This interim remedy addresses the treatment and disposal of contaminated soil that is stockpiled near Site D. The primary contaminants of concern affecting the soil are VOCs including TCE and PCE; other organics including PCBs; and metals including arsenic and lead.

The selected remedial action for the site includes onsite treatment of approximately 1,400 cubic yards of stockpiled soil using mobile infrared thermal treatment technology; analysis of treated soil to ensure PCB treatment goal is met, followed by placement of treated soil in an area near Site D; discharge of treated scrubber wastewater to the TCAAP sanitary sewer system and ultimately to a POTW; decontamination and removal of equipment used in the treatment process; and air monitoring during soil treatment. The estimated total cost for the selected remedy is $1,200,000.

PERFORMANCE STANDARDS OR GOALS: The treatment goal for soil is PCBs 2 mg/kg and is consistent with Toxic Substances Control Act treatment levels.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Arsenic; Clean Air Act; Clean Water Act; Decontamination; Direct Contact; Incineration/Thermal Destruction; Interim Remedy; Lead; Metals; Offsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; PCE; Publicly Owned Treatment Works (POTW); RCRA; Soil; State Permit; State Standards/Regulations; Surface Water Monitoring; TCE; Toxic Substances Control Act; Treatment Technology; VOCs.

NINTH AVENUE DUMP, IN
Second Remedial Action - Final
June 30, 1989

The Ninth Avenue Dump is a 17-acre, inactive chemical and industrial waste disposal site in Gary, Indiana. There is industrial, commerical, and residential development in the surrounding area. There are approximately 60 industrial and residential water supply wells within 1 mile of the site. Interconnecting ponds and wetlands areas border the waste disposal areas into the north, west, and south. The wetlands areas to the east and to the south of the site are relatively undisturbed. Hazardous waste disposal occurred at the site from the early to mid-1970s, with some filling associated with cleanup activities continuing until 1980. Industrial, construction, demolition, and chemical wastes were accepted at the site. Specific industrial wastes which were accepted at the site include oil, paint, solvents and sludges, resins, and flammable, caustic, and arsenic-contaminated materials. A State inspection in 1975 revealed that there were approximately 10,000 55-gallon drums at the site. Additionally, the State estimated that 500,000 gallons of liquid industrial waste were dumped, and 1,000 drums were buried onsite and in contact with ground water. As a result of 1975 state orders and 1980 EPA orders to initiate surface cleanup, the site operator removed drums, tank cars, and some contaminated soil from the site's surface. The first ROD, signed in September 1988, addressed remediation of an oil layer floating on the ground water surface and will include construction of a slurry wall around the contaminated portion of the site and excavation and onsite storage of contaminated soil. This second and final remedial action addresses the remaining threats to the site which include contaminated soil, sediment, fill material, ground water (generally onsite), and oil collected during the first operable unit. The primary contaminants of concern affecting the soil, sediment, fill material, and ground water are VOCs including benzene, TCE, and toluene; other organics including PAHs and PCBs; and metals including lead.

The selected remedial action for this site includes excavating approximately 36,000 cubic yards of the most severely oil-contaminated waste and fill materials from the area inside the slurry wall, onsite thermal treatment of excavated waste, fill, and previously extracted oil, followed by filling the excavated area with incinerator and ground water treatment process residues, discarded drums, contaminated sediment removed from on- and offsite ponds, and trench spoils; covering the area contained by the slurry wall with a RCRA cap; pumping and treatment of ground water inside the slurry wall with reinjection of most of the ground water within the slurry wall to promote soil flushing; dismantling, decontaminating, and removing the oil storage unit constructed under the first operable unit; continued long-term ground water monitoring; air monitoring during remedial activities; and implementing institutional controls to protect the site and restrict ground water use. The estimated present worth cost for this remedial action is $22,209,000 which includes an annual O&M cost of $489,000.

PERFORMANCE STANDARDS OR GOALS: Soil excavation is not designed to clean the area to meet health-based cleanup levels but rather to remove the most highly contaminated fill material and to ensure the long-term effectiveness of the containment and ground water components of the remedy. Chemical-specific treatment standards for soil were not provided. Target cleanup levels for ground water are based on MCLs or a 10^{-5} cumulative carcinogenic risk, whichever is more stringent, for carcinogens; and MCLs, MCLGs, or a hazard index of 1, whichever is more stringent, for noncarcinogens.

INSTITUTIONAL CONTROLS: Deed and access restrictions will be implemented to prohibit use of ground water under the site and to protect the cap.

KEYWORDS: Air Monitoring; Benzene; Capping; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Debris; Decontamination; Direct Contact; Dredging; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Landfill Closure; Lead; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Oils; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Sediment; Soil; Soil Washing/Flushing; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology, Toxic Substances Control Act; VOCs; Water Quality Criteria; Wetlands.

NORTHERNAIRE PLATING, MI

Second Remedial Action - Final
September 29, 1989

The Northernaire Plating site is a former electroplating facility in the Cadillac industrial park in the city of Cadillac, Wexford County, Michigan. Approximately 40 industries operate in the 1-square mile industrial park including Kysor Industrial, another Superfund site. The Kysor Industrial site will be addressed by this action as well. There are several private residences including a trailer park within the industrial park, and another residential neighborhood lies adjacent to the northern boundary of the park. The city of Cadillac water supply well field is located near the center of the park, and ground water beneath the site generally flows towards the city wells. The Clam River flows through the southeast portion of the site draining runoff from the site. The Northernaire Plating facility provided custom chromium and nickel plating finishes to automobile and other metal parts. Improper waste handling and faulty sewer systems are believed to be responsible for releasing toxic compounds (including hexavalent chromium, chromium, and cyanide) to the soil which have subsequently leached from the soil to the ground water. A 1985 ROD addressed the soil contamination and included excavation and offsite disposal of contaminated soil and sewer sediment. Ground water contamination has since been detected throughout the shallow and intermediate aquifers underlying the park. At present the deep aquifer (in which the Cadillac city well field is located) is not affected by this contamination. The primary contaminants of concern affecting the ground water are VOCs including toluene, TCE, PCE, and xylene; and metals including chromium.

The selected remedial action for this site includes a two-stage ground water pumping and treatment system using carbon adsorption for the removal of chromium and air stripping with vapor-phase carbon adsorption for the removal of VOCs and discharge to the Clam River; ground water monitoring; and institutional controls including site access and ground water and land use restrictions. The estimated present worth cost for this remedial action is $16,000,000, which includes present worth O&M costs of $5,000,000 over 60 years.

PERFORMANCE STANDARDS OR GOALS: Ground water will meet or exceed State and SDWA MCL standards. Target cleanup levels for ground water include xylene 440 ug/l, toluene 40 ug/l, PCE 1 ug/l, TCE 5 ug/l, and chromium (hexavalent) 50 ug/l.

INSTITUTIONAL CONTROLS: Institutional controls will be established including site access and ground water and land use restrictions.

KEYWORDS: Air Stripping; Carbon Adsorption; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Drinking Water Contaminants; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; Offsite Discharge; O&M; Onsite Treatment; PCE; Plume Management; Public Health Advisory; RCRA; Safe Drinking Water Act; State Permit; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Xylenes.

OTT/STORY/CORDOVA CHEMICAL, MI

First Remedial Action
September 29, 1989

The Ott/Story/Cordova Chemical site is in Dalton Township, Muskegon County, Michigan. Beginning in 1957, various specialty organic chemical manufacturers operated at the site, producing intermediate items used in making pharmaceuticals, dyestuffs, and agricultural chemicals. Soil and water contamination was noted as early as the 1960s, probably resulting from discharge of production vessel clean out wastes and wastewaters to onsite unlined lagoons, and drums of waste that were accumulated onsite. In 1977 several thousand cubic yards of lagoon sludge and several thousand drums were removed by the State, and in 1982 an alternate water supply was provided to residents in the vicinity of the site. Subsequent investigations detected significant degradation of Little Bear Creek and its unnamed tributary, which flow past the site to the east, as a result of contaminated ground water. Due to the complexity of the site the cleanup will be organized into two distinct operable units. This first operable unit addresses the interception of contaminated ground water entering the Little Bear Creek system. The second operable unit will address contaminated soil, possible ground water remediation, source control, and air and water monitoring. The primary chemicals of concern affecting the ground water and surface water are VOCs including benzene, PCE, TCE, toluene, vinyl chloride, and xylene; other organics including PCBs and pesticides; and metals including arsenic.

The selected remedial action for this site includes pumping and treatment of ground water that would otherwise enter the Little Bear Creek system using UV-oxidation, carbon adsorption, biological treatment (activated sludge), and filtration with discharge to surface water; and environmental monitoring. The estimated present worth cost for this remedial action is $11,751,000, which includes estimated annual O&M costs of $1,500,000 to $1,600,000 for years 1-5.

PERFORMANCE STANDARDS OR GOALS: Effluent quality and stream discharge will meet State NPDES levels which are dependent on final discharge point. ARARs pertaining to ground water restoration will be addressed in a subsequent overall ground water operable unit.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Metals; MCLs; O&M; Onsite Discharge; Onsite Treatment; Organics; PCBs; PCE; Pesticides; Plume Management; RCRA; Safe Drinking Water Act; State Permit; Surface Water; Surface Water Monitoring; TCE; Toluene; VOCs; Water Quality Criteria; Wetlands; Xylenes.

OUTBOARD MARINE, IL

First Remedial Action (Amendment)
March 31, 1989

The Outboard Marine site is on the west shore of Lake Michigan in Waukegan, Illinois. A marine products manufacturing plant operated at the site for approximately 20 years until production ended in the early 1970s. From 1961 to 1972 hydraulic fluid containing PCBs was used at the plant in the die cast works. This fluid was later discharged to Slip 3 of the harbor, a parking lot north of the plant, and three areas known as the North Ditch, Oval Lagoon, and Crescent Ditch. There is an estimated 700,000 pounds of PCBs onsite and approximately 300,000 pounds in Waukegan Harbor. In 1984 EPA began engineering design work for the selected remedial actions presented in a 1984 ROD to clean up contaminated soil and sediment at the site. During 1985, however, all actions were suspended due to litigation between Outboard Marine Corporation (OMC) and EPA regarding EPA access to OMC's property. Section 122 of SARA specifically addressed access problems and upon its effective date, negotiations with OMC resumed for implementation of the remedy. After negotiations between EPA and OMC were completed, a consent decree was signed in 1986 by OMC. Under the consent decree most portions of the remedial action described in the 1984 ROD remain unchanged. An onsite treatment step was added, however, to meet the SARA preference for treatment requirement. The primary contaminants of concern affecting the soil and sediment are organics including PCBs.

The selected remedial action for this site includes construction of a cutoff wall and slurry wall to isolate Slip 3 and form a containment cell; construction of a new slip to replace Slip 3, and relocation of Larsen Marine; removal and treatment using a chemical extraction process or thermal treatment of sediment in Slip 3 exceeding 500 mg/kg PCBs and soil and sediment exceeding 10,000 mg/kg PCBs from the Crescent Ditch/Oval Lagoon Area; dredging of upper harbor sediment above 50 mg/kg and placement of contaminated sediment in the new Slip 3 containment cell; construction of a west containment cell for treatment residues and lower concentration PCB-contaminated soil; construction of an east containment cell around the parking lot area; construction of a temporary, onsite water treatment facility for dredged water; construction of a permanent water treatment facility; onsite treatment of containment cell water followed by discharge to either a POTW or an onsite location; capping of all containment cells; and ground water monitoring. The estimated capital cost for this remedial action is $19,000,000; O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: A PCB cleanup level of 50 mg/kg was established based on site-specific data. Hot spots for soil and sediment have been defined as greater than 500 mg/kg PCBs in the Crescent Ditch/Oval Lagoon and 10,000 mg/kg PCBs in Slip 3. These correspond to "muck" layers below which PCBs have not significantly penetrated. The onsite treatment system is an extraction process, which must result in a 97 percent PCB removal level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Dredging; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PCBs; Public Exposure; Publicly Owned Treatment Works (POTW); ROD Amendment; Sediment; Slurry Wall; Soil; Solvent Extraction; Surface Water; Surface Water Treatment; Toxic Substances Control Act; Treatment Technology.

WAITE PARK WELLS, MN

First Remedial Action - Final
September 28, 1989

The 45-acre Waite Park Wells site is in Waite Park, Stearns County, Minnesota, 1,500 feet east of the Sauk River. Waite Park municipal wells #1 and #3 served the city until December 1984 when routine sampling detected organic contamination in the ground water. The contaminated plume extends east-southeast from the Electric Machinery Manufacturing Company to the wells which are situated in the northeast corner of the Burlington Northern Superfund site.

In January 1985 the State issued a health advisory to residents to discontinue using municipal water for drinking and cooking. A water hook up with St. Cloud, Minnesota was completed in February 1985 to provide the 3,500 Waite Park residents with an alternate water supply. In February 1988, the five responsible parties at the site funded a municipal water treatment system and wells #1 and #3 were returned to service. Remedial investigations did not identify any significant soil contamination at the site in the vicinity of the Electric Machinery Company; however, ground water contamination was identified in the shallow aquifer and, to a lesser extent, in the deep aquifer. This ROD represents the final response action for the Electric Machinery portion of the Waite Park Wells site. The primary contaminants of concern in the ground water are VOCs including PCE and TCE.

The selected remedial action for the site includes ground water pumping and onsite treatment of the contamination plumes of both the shallow and deep aquifers using packed towers aeration (air stripping); discharge of treated ground water from the packed tower aeration system to the Sauk River under an NPDES permit; and surface water monitoring and long-term ground water monitoring. The estimated present worth cost for this remedial action is $913,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water risk reduction will be achieved by continuing to pump and treat ground water until the more restrictive of SDWA MCLs or the State's Recommended Allowable Limits (RALs) for each VOC in the shallow and deep aquifers are met. Chemical-specific cleanup levels include PCE 6.6 ug/l (RAL) and TCE 5 ug/l (MCL). Surface water discharge to the Sauk River will comply with Clean Water Act Ambient Water Quality Criteria. Chemical-specific discharge goals include PCE 8.9 ug/l and TCE 123 ug/l. In addition, discharges to Sauk River will comply with NPDES permit standards.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Offsite Discharge; Onsite Treatment; Organics; PCE; Plume Management; Safe Drinking Water Act; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria.

WAUCONDA SAND & GRAVEL, IL
Second Remedial Action - Final
March 31, 1989

The 74-acre Wauconda Sand & Gravel site includes 52 acres of permitted and unpermitted landfill areas and is in Lake County, Illinois, north of the village of Wauconda. The area neighboring the site includes agricultural land, residential properties including 12 homes within 1 mile of the landfill, and 2 new residential developments. Most residences use well water but the wells lie outside the ground water flow boundaries of the moderately contaminated shallow aquifer, which lies directly beneath the site. A deeper aquifer, which is connected to the shallow aquifer and is the predominant source of drinking water for area residents, does not appear to be contaminated. From 1941 to mid 1978, the site owner accepted primarily nonhazardous municipal, residential, commercial, and industrial wastes; there are, however, an estimated 30,000 cubic yards of hazardous wastes onsite. The landfill was closed in July 1978 and was subsequently covered by a layer of clay and soil. Since the late 1970s leachate has been discharging to a nearby creek, and surface water sampling taken from this creek has revealed low concentrations of VOCs, PCBs, and metals. In a 1985 ROD EPA determined that a leachate collection system was needed to prevent further ground water contamination. This ROD, the second and final operable unit, further characterizes ground water quality via long-term monitoring to ensure that existing measures are protective of human health and the environment. The primary contaminants of concern affecting the ground water, surface water, and air are VOCs including vinyl chloride and benzene; metals including arsenic and lead; and methane.

The selected remedial action for this site includes long-term monitoring of ground water, surface water, and air emissions with possible evaluation of additional remedial alternatives and a ROD amendment if action levels are exceeded; further upgrade of the site cap and possible relocation of a nearby creek; installation and operation of an improved venting system with possible air emissions treatment; continued operation and/or maintenance of the leachate collection and venting systems, site cap, fence, and monitoring well network; and implementation of institutional controls to restrict ground water use. The estimated present worth cost for this remedial action is $12,155,606, which includes annual O&M costs of $174,500.

PERFORMANCE STANDARDS OR GOALS: SDWA MCLs and State Public and Food Processing Standards are considered ARARs for offsite ground water quality. If offsite ground water exceeds an MCL or a 10^{-5} cumulative cancer-risk level for lifetime drinking water usage (excluding arsenic and vinyl chloride) and the representative background concentrations, additional investigations will be performed possibly resulting in a ROD amendment. The leachate collection system will continue to operate until action levels are established and attained. Air emissions will be controlled and treated if the incremental risk to nearby residents is greater than 10^{-6} lifetime exposure.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict the use of ground water from the shallow aquifer.

KEYWORDS: Air; Air Monitoring; Arsenic; Background Levels; Benzene; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; Leachate Collection/Treatment; Lead; MCLs; Metals; O&M; RCRA; Safe Drinking Water Act; State Standards/Regulations; Surface Water; Surface Water Monitoring; VOCs; Water Quality Criteria.

WAUSAU WATER SUPPLY, WI
First Remedial Action
December 23, 1988

The Wausau Water Supply site, also known as the Wausau Groundwater Contamination site, encompasses an area in the northern section of the City of Wausau, Marathon County, Wisconsin. The site contains five of six production wells in the City Well Field and is located on both sides of the Wisconsin River. Production wells CW6, CW7, and CW9 are located in a predominantly residential area on the west side of the river and are collectively referred to as the West Well Field. The remaining two wells, CW3 and CW4, are located in a predominantly industrial section of the city on the east side of the river and are referred to as the East Well Field. The wells supply nearly all the potable water for approximately 33,000 people, as well as irrigation and industrial water to surrounding areas. In 1982, the city discovered that wells CW3, CW4, and CW6 were contaminated with VOCs. Since that time, several systems have been implemented to reduce VOC levels in the water supply. Initially, uncontaminated water from CW9 and CW7 was blended with water from CW3, CW4, and CW6 to dilute the VOC concentrations. However, increasing VOC concentrations resulted in regulatory limits being exceeded. In 1983, EPA granted funds to help design and install a packed tower VOC stripper, and in June 1984 installed a granular activated carbon (GAC) treatment system on CW6 in response to a continued increase in VOC concentration. CW6 previously had been pumped and discharged directly into Bos Creek to block the contaminated plume from reaching CW7 and CW9 to the north, but this resulted in surface water and sediment contamination in Bos Creek. Water from CW6, CW3, and CW4 has been pumped to the city water treatment plant following the installation of VOC stripper towers at the plant during the summer and fall of 1984. However, there is a significant risk of plume migration because CW6 remains the sole interceptor well blocking contamination of the remaining West Well Field. Currently, the city continues to blend treated water with water from uncontaminated supply wells to ensure low VOC levels in its water supply. The scope of this expedited operable unit is limited to the contaminant plume affecting

CW6 in the West Well Field. The primary contaminants of concern affecting the West Well Field at the site are VOCs including TCE.

The selected remedial action for this site includes ground water pumping and treatment using air stripping with discharge to the Wisconsin River; groundwater monitoring; and provision for implementation of an additional extraction well as necessary. The estimated present worth cost for this remedial action is $750,000 with estimated annual O&M costs of $105,000 for year one and $81,000 for subsequent years.

PERFORMANCE STANDARDS OR GOALS: Remedy addresses plume management through pumping and treatment of ground water. Effluent levels to be determined by the State will satisfy the Best Available Technology requirements of the CWA.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Supply; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; O&M; Onsite Discharge; Onsite Treatment; Organics; Plume Management; State Permit; State Standards/Regulations; TCE; VOCs; Water Quality Criteria.

WAUSAU WATER SUPPLY, WI

Second Remedial Action - Final
September 29, 1989

The Wausau Water Supply site, also known as the Wausau Ground Water Contamination site, is in Wausau, Marathon County, Wisconsin. The site includes six city ground water production wells along the east and west sides of the Wisconsin River. These wells supply drinking water to 33,000 people, and is used for industry in the area. Three primary source areas of ground water contamination have been identified; a municipal landfill, the Wausau Chemical Company, and the Wausau Energy Company. The landfill, which is on the west side of the site, operated from 1948 to 1955 and accepted almost all commercial, industrial, and residential waste generated within Wausau. The landfill appears to be the predominant source of TCE contamination in the underlying aquifer. On the east side of the river the Wausau Chemical and Wausau Energy companies are suspected sources of soil and ground water contamination due to spills from past operations. Wausau Chemical, a bulk solvent distributer, was responsible for spilling 1,000 gallons of PCE-contaminated waste in 1983 alone. Wausau Energy, a petroleum bulk storage and disposal center, has reportedly contaminated soil and ground water with petroleum by-products. To provide sufficient water of acceptable quality EPA temporarily installed a granular activated carbon treatment system on one well in 1984 and VOC stripping towers at the municipal water treatment plant to treat water from two contaminated wells. The city has been blending treated water with uncontaminated water to reduce VOC levels. As an interim remedy, EPA signed a 1989 ROD implementing ground water contamination controls, which included pumping and treatment at one of the landfill source areas followed by discharge into the Wisconsin River, to prevent the contaminant plume from migrating to the source of the river. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE and TCE.

The selected remedial action for this site includes treating contaminated soil using an in- situ soil vapor extraction (SVE) system and treating gases emitted from the SVE system using vapor phase carbon filters; and continued pumping and treatment of ground water using existing air strippers with modified pumpage rates. The estimated present worth cost for this remedial action is $738,000, which includes present worth O&M costs of $482,000.

PERFORMANCE STANDARDS OR GOALS: Performance goals for this remedial action are based on the State ground water standards which include PCE 1.0 ug/l and TCE 1.8 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Treatment; MCLs; Municipally Owned Site; O&M; Onsite Treatment; PCE; Plume

Management; Safe Drinking Water Act; Soil; Sole-Source Aquifer; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs.

WEDZEB ENTERPRISES, IN
First Remedial Action - Final
June 30, 1989

The 0.75-acre Wedzeb Enterprises site is located in Lebanon, Indiana, in a mixed residential and light industry neighborhood. About 300 houses are located within 500 feet of the site perimeter. Originally, two warehouses, one of which was used as a storage facility for electrical capacitors and transformers containing polychlorinated biphenyls (PCBs), were located onsite. In May 1981 the warehouse used for storage was completely destroyed by fire, which raised concerns about the release of PCBs into the environment and the potential formation of new compounds such as dioxins and furans. The warehouse contained an estimated 77 tons of electrical capacitors at the time, some of which exploded during the fire. In October 1987 EPA completed a removal action removing onsite debris and contaminated soil and replacing it with clean fill. The remediation of the sanitary sewer sediment in this action serves as a cautionary measure because contaminants may have been washed into the sewer lines during the fire, providing a source of long-term contaminant release to the Lebanon POTW. The primary contaminants of concern affecting the sewer sediment are organics including PCBs.

The selected remedial action for this site includes cleaning the sewer lines with hydraulic jets and vacuum pumping to remove contaminants, followed by filtering the resulting water and sediment to remove PCB-contaminated sediment, and discharging the water to the POTW; offsite incineration and disposal of the estimated 2 drums of sediment and 20 drums of remedial investigation generated waste if PCB levels are 50 mg/kg or greater, or offsite disposal only if PCB levels are below 50 mg/kg; and a television inspection of the pipeline to ensure structural integrity. The estimated present worth cost for this remedial action is $45,000; there are no O&M costs.

PERFORMANCE STANDARDS OR GOALS: In accordance with health-based guidance cleanup levels set forth in the TSCA Spill Policy, the PCB concentration in the sewer sediment will not exceed a 10 mg/kg level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Direct Contact; Incineration/Thermal Destruction; Offsite Discharge; Offsite Disposal; Offsite Treatment; Organics; PCBs; Publicly Owned Treatment Works (POTW); Sediment; Toxic Substances Control Act (TSCA); Treatment Technology.

WHITEHALL MUNICIPAL WELLS, MI
First Remedial Action - Final
September 29, 1989

The Whitehall Municipal Wells site is in Whitehall, Michigan, and includes production well 3 (PW3) which is the the focus of this ROD. PCE has been detected in the soil and ground water. The suspected source of the PCE is a nearby dry-cleaning operation which leaked PCE until the problem was corrected in 1981. In 1980 the State identified PW3 as the source of contamination in the municipal drinking water supply and recommended that the city use PW3 only on an emergency basis. The State continued to monitor the well, and until October 1988 the city used the well only on an as-needed basis at reduced pumping rates. Results from the remedial investigation conducted in 1988-89 revealed only low levels of contamination in the wells; no contaminant exceeded MCLs or MCLGs. In September 1989 the city permanently abandoned PW3 because of the well's poor production capacity, and because new wells and storage facilities built since 1980 have reduced the need for PW3.

The selected remedial action for this site is no further action because the findings of the remedial investigation indicated that contaminant levels in the site's wells do not exceed any State or Federal drinking water standards or criteria and there is no longer a continuing source of contamination. There are no present worth or O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: There are no applicable performance standards for this remedial action because a remedy of no further action was selected.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

WINDOM DUMP, MN
First Remedial Action - Final
September 29, 1989

The 11-acre Windom Dump site is a former municipal landfill in Windom, Cottonwood County, Minnesota. Land use in the vicinity of the site includes residential areas and commercial, industrial, and agricultural operations. City water supply wells northwest of the site lie downgradient of the landfill. Landfilling operations began in the 1930s and continued until 1974. During this period, paint sludges from a large manufacturing operation were disposed of along with municipal refuse resulting in low levels of toxic substances contaminating an underlying aquifer, which is used as a water supply. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, and TCE; metals including arsenic; and other inorganics.

The selected remedial action for this site includes grading and capping the fill area with a two-foot clay cap overlain by one foot of granular material, topsoil, and new vegetation; modifying the existing municipal water plant by installing additional aeration nozzles and structure venting; and ground water monitoring. In the event that allowable contaminant limits are exceeded in the monitoring wells, a contingency plan including a ground water pump and treatment system will be implemented. The estimated present worth cost for this remedial action is $865,000, which includes an annual O&M cost of $5,700 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The municipal water treatment system will remove VOCs and maintain a 10^{-5} lifetime excess cancer risk and contaminant concentrations less than SDWA MCLs. Ground water will be pumped and treated if the ground water exceeds any single allowable contaminant limit. Specific intervention limits are based on State solid waste management rules and include TCE 7.8 ug/l, PCE 1.7 ug/l, benzene 3.0 ug/l, and arsenic 12.5 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Capping; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Contingent Remedy; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Inorganics; MCLs; Metals; O&M; Onsite Containment; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; VOCs.

RECORDS OF DECISION ABSTRACTS
REGION VI
(Arkansas, Louisiana, New Mexico, Oklahoma, Texas)

HOMESTAKE MINING, NM
First Remedial Action - Final
September 27, 1989

The Homestake Mining Company (HMC) site consists of a uranium processing mill and two tailings embankments in Cibola County, New Mexico, about 6 miles north of Milan. The tailings embankments contain a combined total of 22 million tons of tailings material covering 225 acres. Four housing subdivisions are south and southwest of the mill with the nearest residence approximately 0.6 mile from the tailings embankments. In 1983 elevated levels of selenium were found in offsite ground water prompting EPA to require HMC, under a consent agreement, to supply municipal water to residents in the subdivision south of the mill. Furthermore, HMC implemented an aquifer protection and restoration program including ground water injection/collection efforts at the site, which was subsequently formalized, modified and approved pursuant to requirements of the State. The restoration program continued to operate and has been largely successful in onsite containment of tailings seepage. This ROD addresses possible radon releases from the uranium mill operations into residential subdivisions. From 1987-1989 HMC, under an Administrative Order on Consent, conducted an investigation as to whether radon associated with the uranium mill tailings operation might be influencing outdoor and indoor radon levels in the subdivisions. Based on the results of HMC's investigation, EPA has determined that the uranium mill and tailings embankments at the site are not contributing significantly to offsite subdivision radon contamination and that it does not have authority under CERCLA to address radon levels due to natural soil concentrations. In June 1986 the Nuclear Regulatory Commission (NRC) resumed jurisdiction over uranium mills in the State and issued HMC a radioactive materials license. NRC intends to close the site pursuant to their regulations and will coordinate their requirements with EPA. The selected remedial action for this site is no further action for the Radon Operable Unit. However, EPA is recommending radon reduction techniques to residents having elevated indoor radon levels.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

MOTCO, TX
Second Remedial Action - Final
September 27, 1989

The 11-acre Motco site is in La Marque, Galveston County, Texas. The site is on the Gulf Coastal Plain at the edge of a coastal marsh system and is within the 100-year tidal floodplain. Significant site features include seven unlined pits which have a total surface area of 4.6 acres and contain surface water, organic liquids, and various sludges, tars, and other solids. The pits were used by a styrene tar recycling business which operated from 1959 to 1961, and by an industrial chemical waste disposal facility from 1961 to 1968. EPA conducted three emergency response actions between 1981 to 1983 to treat and discharge excess pit surface water collected in dikes that were constructed by the Coast Guard in 1980. In 1984 an initial remedial measure (IRM) was conducted by EPA and included removal and offsite disposal of wastes from nine above ground storage tanks. The first operable unit for the site was issued in 1985 and dealt with source control measures including excavation of the onsite waste pits, which contained 12 million gallons of contaminated water and organic liquids, down to the sludge/soil interface plus one foot, and incineration of those wastes. This ROD represents the second and final operable unit, management of migration, for the site and addresses the subsurface beneath the waste pits and offsite contamination of the ground water, soil, and sediment. Ground water at the site is found in a Transmissive Zone and the underlying Upper Chicot aquifer. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene; other organics including PAHs; and metals including arsenic, chromium, and lead.

The selected remedial action for the site includes extraction and onsite treatment by best available technology (BAT) of contaminated shallow and deep ground water; extraction and incineration of approximately 1 to 2 million gallons of dense, non-aqueous phase organic liquids; installation of a ground water gradient to impede further contaminant migration from shallow to deep ground water; implementation of ground water compliance monitoring of the shallow and deep ground water aquifers which would trigger more aggressive removal operations if indicator compounds exceed one-half MCL or a 10^{-6} risk level; excavation, consolidation and onsite containment and capping of approximately 140,000 cubic yards of contaminated surface soil and sediment to a maximum depth of four feet; and implementation of deed restrictions and installation of additional fences around the site. The estimated total present worth cost for the selected remedy is $8,810,000, which includes an annual O&M cost of $453,000.

PERFORMANCE STANDARDS OR GOALS: Treatment of ground water using BAT is expected to meet Federal and State discharge standards. If discharge standards are not met, ground water will be sent to a wastewater treatment plant. Cleanup goals for the Upper Chicot Aquifer are SDWA MCLs or a 10^{-6} cancer-risk level. Treatment of shallow transmissive zone ground water will be to health-based numbers, including a total cumulative level for all PAHs of 0.0028 ug/l. Soil/ sediment excavation will be determined by a 10^{-6} risk level.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prohibit land development.

KEYWORDS: Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; Treatment Technology; VOCs; Water Quality Criteria; Wetlands.

PESSES CHEMICAL, TX

First Remedial Action - Final
December 22, 1988

The 4.2-acre Pesses Chemical site is located in Tarrant County, Ft. Worth, Texas. The site is situated in a light industrial and commercial area with approximately 19,500 people estimated to reside or work within a one-mile radius. The site is divided into two sections. The northern section is fenced and includes an occupied office building and brick warehouse as well as the former operations area composed of a metal warehouse, various equipment, a bag house, a storage yard, and two underground sumps. The southern portion contains the abandoned south field. In June 1979, the Pesses Company began operations to reclaim cadmium and nickel from dry-cell batteries and metal sludges without required construction of operation permits. During July and August 1979, excessive cadmium emissions were investigated by both the city and State air pollution control offices. After operations began again, cadmium emissions were measured as high as 2,900 percent above permit limits. In January 1981, the parent company declared bankruptcy and site operations were discontinued. In March 1983, a grass fire at the site resulted in toxic cadmium oxide fumes which hospitalized a firefighter. Approximately 1,500 deteriorating drums remained onsite with heavy metal sludges, power, and empty battery cases. Consequently, in April 1983, EPA removed 3,400 cubic yards of soil, drummed material, and debris from the site and installed a clay cap in the south storage yard to prevent exposure to contaminated soil. Heavy metals contamination of airborne dust and surface water runoff are the main potential threats at the site. In addition to soil contamination, two sumps in the southern portion contain 1,914 gallons of liquid contaminated with metals and 16.6 cubic yards of sludge contaminated with cadmium and nickel. Furthermore, there is limited cadmium contamination of offsite soil. The primary contaminants of concern affecting the soil, building, and equipment and debris are metals including lead.

The selected remedial action for this site includes consolidation of wastes and contaminated offsite soil with incorporation into onsite soil, followed by in-situ stabilization and installation of a concrete cap around the fenced portion of the site and a RCRA clay cap placed in the south field; decontamination of metal warehouse and equipment with resultant solid wastes combined with the soil remediation and wastes treated and discharged into the sewer system; offsite disposal of drums and debris as well as equipment which cannot be adequately cleaned and water above discharge requirements; and cleaning and sealing of sumps. The estimated capital cost for this remedial action is $1,200,000 with an annual O&M cost of $7,000.

PERFORMANCE STANDARDS OR GOALS: Target soil action levels are cadmium 15 mg/l and nickel 100 mg/l based on a 10^{-6} carcinogenic-risk level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Capping; Clean Closure; Debris; Decontamination; Direct Contact; Excavation; Lead; Metals; Offsite Disposal; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Publicly Owned Treatment Works; RCRA; RCRA Closure Requirements; Sludge; Soil; Stabilization; Treatability Studies; Treatment Technology.

SHERIDAN DISPOSAL SERVICES, TX

First Remedial Action
December 29, 1988

The 110-acre Sheridan Disposal Services site is approximately 9 miles northwest of the city of Hempstead in Waller County, Texas. The site is located on the 100-year floodplain of the Brazos River and is bordered by a lake to the south, farmland, and a community of 20 residences to the north. The Evangeline aquifer, which runs under the site, is used to meet the drinking water needs of several communities nearby. Sheridan Disposal Services operated as a commercial waste disposal facility from about 1958 to 1984 using steam distillation, open burning, incineration, and direct disposal into a waste lagoon to dispose of various organic and inorganic chemical and solid wastes. The site includes a 12 to 22-acre lagoon, a 17-acre dike surrounding the lagoon, a 42-acre evaporation/land irrigation system, and an incinerator and 9 waste storage and treatment tanks located on the lagoon dikes. The primary contaminants of concern affecting the soil and sludge are VOCs including benzene and toluene, and other organics including PCBs.

The selected remedial action for the site includes excavation of all material with PCB concentrations greater than 25 mg/kg including 13,000 cubic yards of pond and dike soil, 31,000 cubic yards of pond sludge, and 300 cubic yards of floating oil and emulsion in the pond and storage tanks. This will be followed by onsite biotreatment of contaminated soil, sludge, and oil with stabilization and onsite disposal of residuals in the pond. If PCB concentrations in the residuals are less than 50 mg/kg, they will be placed under a RCRA-compliant cap. Residuals with PCB concentrations greater than 50 mg/kg PCB will be placed in a RCRA-compliant landfill in the pond area. In addition, the remediation requires capping the entire pond and dike area; decontamination and offsite disposal of tanks, drums, and debris; treatment to BAT of any contaminated wastewater and stormwater with discharge to the river; implementation of engineering controls to prevent bank erosion on the river; and ground water monitoring. The estimated present worth cost for this remedial action is $27,956,000, which includes total O&M costs of $863,000.

PERFORMANCE STANDARDS OR GOALS: An action level for PCBs was established at 25 mg/kg based on a health-risk analysis and the TSCA Spill Policy. Waste residuals will be disposed of according to PCB levels.

INSTITUTIONAL CONTROLS: Restrictions were implemented at the site to prevent ground water use and to preserve the integrity of the cap.

KEYWORDS: Benzene; Biodegradation/Land Application; Capping; Carbon Adsorption (GAC);

Debris; Decontamination; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Levees; O&M; Offsite Disposal; Oils; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Public Exposure; Sludge; Soil; Surface Water; Surface Water Collection/Diversion; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs.

SHERIDAN DISPOSAL SERVICES, TX

Second Remedial Action
September 27, 1989

The 110-acre Sheridan Disposal Services site is 9 miles northwest of Hempstead, Waller County, Texas. Agriculture and rangeland are the predominant land uses in the area. The site is within the 100-year floodplain of the Brazos River. Sheridan Disposal Services operated a commercial waste disposal facility at the site from 1958 to 1984. The facility treated a variety of organic, inorganic, and solid waste by stream distillation, open burning, and incineration. Significant site features include a lagoon which was used as a holding pond for overflow wastes and treatment residues, a 17-acre dike surrounding the lagoon, and a 42-acre evaporation and land irrigation system used for disposal of water accumulated on the lagoon. An incinerator and a group of nine former waste storage and treatment tanks are situated on the lagoon dikes. A source control ROD was issued in December 1988 and addressed risks associated with exposure to contaminated soil and sludge at the site. This remedial action represents the second of two operable units for the site and its goal is to prevent exposure to contaminated ground water and maintain protective levels in the river. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, and TCE; and metals including arsenic.

The selected remedial action for this site is natural attenuation, and the establishment of Alternate Concentration Limits (ACLs) as the site ground water protection standards; ground water monitoring to ensure ACLs are not exceeded; sampling and analysis of the Brazos River immediately upgradient and downgradient of the entry point of ground water into the River; implementation of ground water use restrictions to ensure affected ground water is not consumed; and the implementation of a corrective action plan if ACLs are exceeded in the future. The estimated present worth cost for the selected remedy is $194,000, which is due entirely to O&M.

PERFORMANCE STANDARDS OR GOALS: EPA has set ACLs for contaminants detected in the ground water to meet drinking water criteria in the Brazos River. Chemical-specific ACL concentrations were selected for benzene 26 mg/l, TCE 26 mg/l, PCE 41 mg/l, and arsenic 260 mg/l.

INSTITUTIONAL CONTROLS: Ground water use at the site will be restricted to ensure that contaminated ground water is not consumed and that the integrity of the Brazos River as a hydraulic barrier to ground water flow is maintained.

KEYWORDS: ACL; Arsenic; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; MCLs; Metals; PCE; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria.

SOUTH VALLEY, NM

Fifth Remedial Action - Final
March 30, 1989

The South Valley/Edmunds Street site is a portion of the South Valley Superfund site - a large area in the southern part of the city of Albuquerque, New Mexico. The South Valley site surrounds a city municipal water well identified as San Jose-6. Within this larger area are a number of industrial properties owned and operated by different groups and individuals. The site has been divided into operable units to address soil and ground water contamination resulting from current and historical industrial practices. The operable units include Edmunds Street Ground Water, Former Air Force Plant 83/GE, San Jose-6, and the final operable unit, Edmunds Street Source Control. Potential sources of ground water contamination within the Edmunds Street property have been identified, but primary focus has been given to a drainage pit area which receives most of the drainage from the property. Investigations in all of the suspected potential contaminant source areas, however, revealed little soil contamination. Even if further migration of contaminants to ground water occurs, the ground water treatment system developed in the previous Edmunds Street Ground Water operable unit will be sufficient to address these concerns. There are no contaminants of concern affecting the soil at this site.

The selected remedial response for this final operable unit is no further action. Based on sampling data, the soil has been determined to contain contaminant levels below hazardous contaminant concentration limits and poses no risk to human health or the environment. The only further activities anticipated at the site are sampling of soil gases in the drainage pit area following the ground water remedial action, and the precautions necessary to prevent any disturbance of drainage pit soil during the ground water remediation. There are no remedial or O&M costs associated with this operable unit.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific standards or goals are not applicable for this no action remedy.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

UNITED CREOSOTING, TX

Second Remedial Action - Final
September 29, 1989

The 100-acre United Creosoting site is in Conroe, Montgomery County, Texas. The site currently is occupied by a distributing company, a construction company, and a residential subdivision. From 1946 to 1972, the United Creosoting Company operated a wood preserving facility at the site which used PCPs and creosote in the wood preservation process. PCP and creosote wastes were stored in two waste ponds on the property of the distributing company. During 1980 the county improved area roads using soil and waste pond backfill from the site. Because residents living near the improved roadways experienced health problems, the county sampled and compared leachate composition from the affected roadways and the site and determined that the leachate from both the site and the roadways were contaminated with PCPs. Roadway soil was subsequently removed and disposed of using land farm treatment. In 1983, due to contaminated stormwater runoff from the former waste pond areas, the property owner was directed under terms of an EPA Administrative Order to regrade contaminated soil, divert surface water drainage away from the residential portion of the site, and cap contaminated soil. This ROD specifies a final remedy for the contaminated soil and complements a 1986 ROD which determined that no action is necessary to remediate shallow ground water. The primary contaminants of concern affecting the soil are organics including PAHs, PCPs, and dioxins.

The selected remedial action for this site includes excavation and onsite treatment of 94,000 cubic yards of soil containing contaminants which exceed target action levels, using critical fluid extraction and recycling or discharging wastewater generated during the treatment process; incinerating and disposing of the liquid organic concentrate residues offsite; spreading treated soil on the commercial portion of the site; backfilling residential areas with clean fill; and air monitoring. The estimated present worth cost for this remedial action is $22,000,000 which includes present worth O&M costs of $19,750,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil will be excavated and treated if soil exceeds established target action levels. The target action levels vary depending on whether the soil was excavated from the residential or commercial portion of the site. Specific target action levels for carcinogens in excavated soil include PAHs 330 ug/kg for the residential area and PAHs 40,000 ug/kg for the commercial area of the site. Target action levels for dioxins and furans in excavated soil are based on 2,3,7,8-TCDD 1 ug/kg for the residential area and 2,3,7,8-TCDD 20 ug/kg for the commercial area. Specific target action levels for noncarcinogens include PAHs 2,000 mg/kg and PCP 150 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Clean Air Act; Clean Water Act; Dioxin; Excavation; Filling; Floodplain; Incineration/Thermal Destruction; Offsite Disposal; Offsite Treatment; O&M; Organics; Onsite Discharge; Onsite Disposal; Onsite Treatment; PAHs; RCRA; Soil; Solvent Extraction; State Standards/Regulations; Temporary Storage; Treatment Technology; Water Quality Criteria.

RECORDS OF DECISION ABSTRACTS
REGION VII
(Iowa, Kansas, Missouri, Nebraska)

ARKANSAS CITY DUMP, KS
Second Remedial Action - Final
September 19, 1989

The 200-acre Arkansas City Dump site, in Arkansas City, Cowley County, Kansas, abuts a levee to the west and south which separates the site from the Arkansas River. Between 1916 and 1927, an oil refinery was operated onsite processing between 6,000 and 12,000 barrels of oil per day. After an explosion destroyed the refinery in 1927, the site was used as a municipal landfill. The refinery treated petroleum fractions with sulfuric acid to improve color and to remove asphaltenes, parafins, and resinous substances generating acid sludge waste in the process. The sludge waste was disposed of onsite in earthen pits in the north waste area and remediation of this area was addressed in a 1988 ROD, as operable unit one. The second and final operable unit addresses the remainder of the site, which contains subsurface petroleum contaminants trapped in the soil below the water table as a result of petroleum spills. Results from remedial investigations revealed only low levels of soil and ground water contamination due to the petroleum wastes although municipal wastes were also disposed of onsite. These contaminants, however, are not being released in significant concentrations and do not pose a significant threat to human health or the environment.

The selected remedial action for this site is no further action beyond the remedy selected in the first ROD on the site. Because EPA lacks jurisdiction or authority under CERCLA/SARA to undertake remedial action for petroleum-related contaminant releases, no further action will be taken under the Superfund program. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water; No Action Remedy; Oils; Soil.

CHEMPLEX, IA
First Remedial Action
September 27, 1989

The Chemplex site is in Clinton County within 5 miles of Clinton, Iowa, and includes a landfill, a wastewater treatment plant, and an adjacent facility which manufactures high and low density polyethylene. Several residences with private wells are located around the site and a tributary to Rock Creek lies to the south and southeast of the site. Rock Creek eventually discharges to the Mississippi River just above the Upper Mississippi River Wildlife Refuge. The direction of ground water flow beneath the site appears to be toward the southwest, although a mounding effect is causing ground water to flow radially from the center of the landfill. From 1968 to 1978 the landfill area was used for disposal of various plant wastes including black oily sludge, scrap polyethylene, construction debris, and carbonate sludge. The debutanized aromatic concentrate (DAC) area, which consists of a pit and DAC product storage and loading areas, was contaminated by DAC spillage. In 1987, waste was reportedly removed from an onsite polishing basin and disposed of in a RCRA-permitted landfill. Wastes and spills have contaminated the soil and ground water underneath the landfill and DAC areas. This first operable unit will address the plumes of ground water contamination. A subsequent operable unit remedy for this site will address the cleanup of soil and other ground water remediation that may be required. The primary contaminants of concern affecting the ground water are VOCs including benzene, toluene, xylenes, TCE, and PCE; and other organics including carcinogenic and noncarcinogenic PAHs.

The selected remedial action for this first operable unit includes pumping and pretreatment of ground water followed by treatment of pretreated ground water at the existing onsite biological activated sludge wastewater treatment plant with discharge to the Mississippi River via Rock Creek; and implementation of ground water use restrictions. The estimated present worth cost for this remedial action is $2,622,000, which includes an annual O&M cost of $219,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals were derived from Health Advisory Levels (HALs), Negligible Risk Levels (NRLs), CWA Water Quality Criteria (WQC) and SDWA MCLs. Specific goals include benzene 1.0 ug/l (NRL), toluene 2,000 ug/l (HAL), PCE 10 ug/l (HAL), TCE 3.0 ug/l (NRL), and xylene 10,000 ug/l (MCL).

INSTITUTIONAL CONTROLS: Institutional controls will be used to restrict use of ground water until remedial actions achieve cleanup of the contaminated ground water to required levels. In addition, deed restrictions will be implemented to prevent the sale of the landfill or a change in land use without State approval.

KEYWORDS: Air Stripping; Benzene; Biodegradation; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Ground Water; Ground Water Treatment; Institutional Controls; MCLs; Offsite Discharge; Offsite Disposal; O&M; Onsite Treatment; Organics; PAHs; PCE; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Xylenes.

CHEROKEE COUNTY, KS
Second Remedial Action
September 18, 1989

The Cherokee County site is a lead and zinc mining area in the southeastern corner of Kansas. The 25 square-mile Galena subsite is one of six subsites within the Cherokee County site and consists of large areas covered by mine wastes, water-filled subsidence craters, and open mine shafts. Many of the shafts are direct conduits to the shallow ground water aquifer which is the sole source of drinking water for approximately 1,050 persons residing outside of the Galena city limits. The approximately 3,500 Galena residents receive their water supply from two deep aquifer wells. EPA began investigations of the Galena subsite in 1985 and determined that the shallow ground water aquifer and surface water were contaminated with elevated concentrations of metals. The first operable unit was signed in 1987 and provides for construction of an alternate water supply to serve rural residents in the vicinity of Galena, previously reliant on the shallow ground water. EPA has in the interim installed water treatment units on several private wells. This ROD represents the second of two operable units and addresses the threat of contamination to the shallow ground water aquifer and surface water. The primary contaminants of concern affecting the ground water and surface water are metals including cadmium, lead, and zinc.

The selected remedial action for this site includes the removal, consolidation, and onsite placement in mine pits, shafts, and subsidences of surface mine wastes; diversion and channelization of surface streams with recontouring and vegetation of land surface; and investigation of deep aquifer well quality followed by plugging all abandoned and inactive wells and rehabilitating active wells, if necessary. The estimated present worth cost for this remedial action is $8,295,215, which includes an annual O&M cost of $14,963.

PERFORMANCE STANDARDS OR GOALS: The selected remedy provides action levels for the selective placement of mine wastes below ground. Chemical-specific action levels include lead 1,000 mg/kg, cadmium 25 mg/kg, and zinc 5,000 mg/kg.

INSTITUTIONAL CONTROLS: Institutional controls will include deed restrictions prohibiting future mining or excavation on the affected properties or other activities that would compromise the remedial action.

KEYWORDS: Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Institutional Controls; Lead; MCLs; MCLGs; Metals; Mining Wastes; O&M; Onsite

Containment; Safe Drinking Water Act; Sole-Source Aquifer; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Wetlands.

DOEPKE DISPOSAL (HOLLIDAY), KS

First Remedial Action - Final
September 21, 1989

The Doepke Disposal (Holliday) site is an inactive industrial-waste landfill located east of Holliday, Johnson County, Kansas. The 80-acre site is within 500 feet of the Kansas River and lies upstream of the well field and Kansas River water intakes that supply water to approximately 200,000 county residents. Additional features bordering the site include an inactive landfill and an active landfill. During the 1950s and early 1960s the site was used as a landfill for residential refuse. In 1963 Doepke Disposal Service, Inc. leased the property and operated a commercial and industrial waste landfill until 1970, when the State shut down the operation. Materials such as fiberglass, fiberglass resins, paint sludges, spent solvents, metal sludges, soaps, and pesticides were reportedly disposed of at the landfill. In 1966 fire debris and up to 374 drums of solvents and organochlorine and organophosphate pesticides were disposed of at the site as a result of a fire at a Kansas City chemical plant. Initially wastes and residues brought to the site were burned, however, in the late 1960s burning operations ceased and solid wastes were buried onsite and liquids were disposed of in two surface impoundments. In 1977 rock material excavated during the construction of an interstate was dumped onsite and in some cases over the deposited waste. The current owner uses portions of the site for storage of clay, crushed shales, and crushed limestone. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, and xylene; other organics including PAHs, PCBs, and pesticides; and metals including chromium and lead.

The selected remedial action for this site includes removal and offsite treatment of approximately 96,000 gallons of liquids currently ponded underground in former surface impoundments; construction of a multilayer cap over the majority of the waste disposal area; collection of ground water seepage and offsite treatment at a POTW, as necessary; ground water monitoring; and implementation of deed and access restrictions. The estimated present worth cost for this remedial action is $5,970,000, which includes an estimated annual O&M cost of $107,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: No cleanup criteria were established for soil because soil is going to be capped. Ground water standards for ground water seepage, treatment and/or discharge were based on Federal water quality criteria for protection of aquatic life and State water quality standards and were determined for four metals and five organic pesticides.

INSTITUTIONAL CONTROLS: Deed and site access restrictions will be implemented as part of this remedial action.

KEYWORDS: Benzene; Carcinogenic Compounds; Capping; Chromium; Clean Water Act; Closure Requirements; Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Offsite Treatment; Onsite Containment; Organics; PAHs; PCBs; Pesticides; Publicly Owned Treatment Works (POTW); RCRA; Soil; Solvents; State Standards/ Regulations; Toluene; Water Quality Criteria; VOCs; Xylenes.

FINDETT, MO

First Remedial Action
December 28, 1988

The Findett/Hayford Bridge Road Ground Water site is located just north of the city of St. Charles, in St. Charles County, east-central Missouri. The site lies 3.2 miles south of the Mississippi River and is within the floodplain. Land use in the site vicinity is primarily agriculture, but also includes a small industrial park containing Findett Corporation, Cadmus Corporation, and several other commercial and light industrial establishments. In addition, there are several residences within approximately 1,000 feet northeast and 1,500 feet south of the site. The Elm Point Wellfield, the primary drinking water supply for St. Charles, is located 1,800 feet northeast (downgradient) of the site. Until 1980, Findett Corporation reclaimed heat transfer fluids or oils, some of which contained PCBs, and received waste solvents for reclamation or recycling. Subsequently, Findett has custom blended or manufactured organic chemicals for other companies. The Findett site originally came to EPA's attention when Findett Corporation reported its handling of PCBs at the site. There is PCB-contaminated soil at the Findett facility as well as the adjacent Cadmus Corporation facility. The Elm Point Well Field is also at risk of contamination by releases from the site. Findett conducted several voluntary PCB soil cleanups pursuant to EPA Administrative Orders in 1981 and 1982; however, PCBs as well as VOCs remain in the soil in concentrations above recommended levels. In addition, ground water investigations revealed substantial VOC contamination in the shallow aquifer near the contaminant sources and in the deep aquifer tapped by the nearby well field as a drinking water source. The primary contaminants of concern affecting the soil and ground water are VOCs; and other organics including PCBs.

The selected operable unit remedial action for this site includes onsite ground water pumping and treatment using air stripping with discharge to the POTW; and excavation of contaminated soil with either offsite disposal or treatment. The capital costs for the PRP's implementation of the remedy are estimated at $1,100,000.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil will be removed and either disposed of offsite or treated. Ground water will be treated to remove organic contaminants before it is discharged to the sewage treatment plant. Individual contaminant goals were not provided for either soil or ground water.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Treatment; O&M; Offsite Discharge; Offsite Treatment; Organics; PCBs; Plume Management; Publicly Owned Treatment Works; RCRA; Soil; VOCs.

HASTINGS GROUND WATER CONTAMINATION, NE

First Remedial Action
September 26, 1989

The Hastings Ground Water Contamination site is a contaminated aquifer in the vicinity of the city of Hastings, Adams County, Nebraska. The site consists of several source areas, referred to as subsites, contaminated with various chlorinated volatile industrial chemicals. This ROD addresses the Well Number 3 subsite which consists of a ground water plume contaminated with carbon tetrachloride emanating from a former grain storage facility. The State first identified volatile organic contamination in Well Number 3 in 1983. Between 1986 and 1989 EPA conducted a field investigation which identified the grain storage area as the source of ground water contamination probably resulting from accidental spills of liquid fumigants used during grain storage. This interim source control operable unit was developed to reduce the migration and volume of volatile contaminants present in the soil. The primary contaminants of concern in the soil which impact the ground water are VOCs including carbon tetrachloride and chloroform.

The selected remedial action for this site includes utilization of in-situ soil vapor extraction to remove approximately 400 pounds of VOCs from the soil; treatment of vapor emissions by a vapor phase granular activated carbon system; and replacement of spent granulated activated carbon filters followed by offsite disposal at an approved treatment facility for regeneration or incineration. The estimated capital cost for this remedial action is $874,000 with an annual O&M cost of $154,000.

PERFORMANCE STANDARDS OR GOALS: This interim source control action is not designed to restore the aquifer to drinking water standards; therefore, no cleanup levels have been established for ground water at this time. Cleanup effectiveness will be based on the volume of volatile contaminants recovered from the soil. It is estimated that the soil vapor extraction method will recover approximately 400 pounds of VOCs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Carbon Adsorption (GAC); Ground Water Monitoring; Incineration/Thermal Destruction; Interim Remedy; O&M; Onsite Treatment; RCRA; Soil; Treatment Technology; VOCs.

JOHNS' SLUDGE POND, KS

First Remedial Action - Final
September 22, 1989

The Johns' Sludge Pond site is in a relatively undeveloped area in the city of Wichita, Sedgwick County, Kansas. The 0.5-acre site, which lies within the 500-year floodplain of the nearby Little Arkansas River, neighbors a large rail yard, an interstate highway, a large borrow pit, and farm land. The city of Wichita owns approximately 1/3 of the site as a result of condemnation for highway drainage. During the 1950s and 1960s the Super Refined Oil Company used the sludge pond for the disposal of waste oil and up to 15,000 cubic yards of oily sludge generated by the oil recycling and reclamation operation. Because sulfuric acid was used to refine waste oil for recycling, the wastes dumped into the pond were very acidic. Additionally, high lead concentrations and low PCB concentrations (less than 50 ppm) were also detected in the sludge. As surface water flowed into the pond, an extremely acidic layer of water formed on top of the sludge which often overflowed into nearby surface waters. The city subsequently built berms to prevent further surface runoff. In 1983 EPA ordered the city to undertake interim cleanup activities which consisted of excavating and solidifying the sludge using cement kiln dust with redeposition of the treated sludge into a compacted clay-lined cell followed by capping using a compacted clay cap. Surface and ground water monitoring following the interim action have not detected any contaminant levels that would require further action.

The selected remedial action for this site includes a no further action scenario. Previous interim remedial activities were adequate to protect human health and the environment. There are no additional costs associated with this no action remedy. The city will continue to provide post-closure maintenance. The county will continue to provide post-closure monitoring.

PERFORMANCE STANDARDS OR GOALS: Land use controls, including deed restrictions, have been instituted preventing or controlling future site uses which could damage the effectiveness of the remedy.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Floodplain; Municipally Owned Site (partially); No Action Remedy.

KEM-PEST LABORATORIES, MO

First Remedial Action
September 29, 1989

The Kem-Pest Laboratories site is a former pesticide manufacturing facility approximately 3-miles northeast of Cape Girardeau, Cape Girardeau County, Missouri. This 6-acre site is in a rural area devoted primarily to agricultural activities. Contamination at the site resulted from the manufacturing of pesticide products from 1965 until 1977. Production activities took place in an onsite concrete block formulation building. Sewage and plant wastes were disposed of in an onsite lagoon which was backfilled with clay in 1981. EPA investigations beginning in 1981 have identified pesticide and volatile and semi-volatile organic contamination in soil, sediment in drainage channels, and in ground water. This operable unit addresses contaminated soil and sediment. Future operable units will address ground water and the formulation building. The primary contaminants of concern affecting the soil and sediment are VOCs including xylenes; other organics including organochlorine and pesticides; and metals including arsenic.

The selected remedial action for this site includes excavating approximately 4,050 cubic yards of contaminated soil and sediment with offsite disposal in a RCRA-approved commercial hazardous waste landfill; sampling to verify that the extent of excavation is sufficient to meet health-based cleanup goals; and backfilling the excavated area with clean soil and revegetating. The estimated present worth cost for this remedial action is $2,600,000 with no O&M required.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil and sediment will be excavated down to a level consistent with a 10^{-5} cancer-risk level. Chemical-specific goals were provided for ten pesticides and for arsenic.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Clean Closure; Direct Contact; Excavation; Metals; Offsite Disposal; Organics; Pesticides; RCRA; Sediment; Soil; State Standards/Regulations; VOCs; Xylenes.

SOLID STATE CIRCUITS, MO

First Remedial Action - Final
September 27, 1989

The Solid State Circuits (SSC) site, a former industrial and manufacturing facility, is in Republic, Missouri, approximately twelve miles southwest of Springfield. The approximately 1/2-acre site has residential areas to the east, west, and south, and light industry and warehousing to the north and south. The city of Republic obtains its drinking water from three municipal wells (2, 3, and 4) which draw from the deepest of three underlying aquifers. The site currently consists of a former manufacturing building, two air strippers, and an excavated yard area (from prior removal actions). Uses of the facility since 1902 included milling, refrigeration, printed circuit board manufacturing, and photoprocessing, as well as other unknown activities. The major wastes generated appear to have been cleaning solvents used in the circuit board process and wastewaters from the circuit board activities. Sampling by the State in 1982 revealed contamination with TCE in Municipal Well Number 1, 500 feet south of the site. The SSC site was identified as a possible source. Subsequent actions by EPA, the State, SSC, and the city included pumping tests, several major soil and debris excavations and removals (thereby eliminating the source of contamination), and taking Municipal Well Number 1 out of service. This ROD addresses the ground water contamination found in all three aquifers. Contamination was found in the ground water, water in utilities, and air. The primary contaminants of concern are VOCs, particularly TCE.

The selected remedial action for this site includes ground water pumping and onsite treatment using existing air strippers, discharging the treated water to a POTW, plume control via pumping, and BACT (as required) for air emissions; and air and water monitoring. The estimated present worth cost for this remedial action is $4,629,000, which includes an annual O&M cost of $445,300.

PERFORMANCE STANDARDS OR GOALS: The target for the ground water extraction process is a 10^{-6} cancer risk and hazard indices ratio of less than 1. All ground water with a TCE level exceeding 5 ug/l will be remediated at a POTW. Ground water with TCE levels above the POTW pretreatment standard of 200 ug/l will be treated in the onsite air strippers before discharge to the POTW. The POTW must meet the State NPDES average monthly discharge limit of TCE 2 ug/l.

INSTITUTIONAL CONTROLS: City ordinances will prevent new drinking well construction in or near the plume to prevent ingestion of contaminated water.

KEYWORDS: Air Monitoring; Air Stripping; Clean Air Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Offsite Discharge; O&M; Onsite Treatment; Plume Management; POTW; Safe Drinking Water Act; Solvents; State Permit; State Standards/ Regulations; Surface Water Monitoring; TCE; VOCs.

TODTZ, LAWRENCE FARM, IA

First Remedial Action - Final
November 4, 1988

The 2.7-acre Dupont Impoundment at the Todtz Farm site is part of the 12-acre parcel of land known as the Todtz Farm Landfill, which is located on a 120-acre farm 1.25 miles west of Camanche, Iowa. Originally a sand and gravel mine, the landfill received municipal waste from 1969 to 1975. In 1971, Dupont constructed the impoundment in the northwest corner of the landfill and disposed of an estimated 4,300 tons of wet end cellophane process wastes from 1971 until its closure in 1975. Impoundment wastes are periodically in direct contact with the ground water beneath the site, which flows southeasterly toward the Mississippi River. Domestic wells and the municipal water supply wells for Camanche located downgradient of the site may be affected by contamination from the site. In addition, several ponds and lakes in the vicinity are potential receptors for contaminated runoff and recharge. The primary contaminants of concern affecting the ground water are VOCs including toluene, carbon disulfide, tetrahydrofuran, and benzene; and metals including arsenic, lead, and chromium.

The selected remedial action for this site includes installation of a soil cover over the Dupont Impoundment; implementation of institutional controls including deed and land use restrictions; provision of an alternate water supply for an affected residence by relocating an existing well; and ground water monitoring. EPA has determined that further remedial actions will be immediately implemented if ground water trigger levels provided in the ROD are met or exceeded. If ground water monitoring indicates that contaminant levels exceed the less stringent chemical-specific action levels provided in the ROD, ground water pumping and treatment will be implemented; if the more stringent action levels are exceeded, a treatability study of the impoundment waste will be conducted and either a permanent treatment remedy of the impoundment material or a cap and slurry wall containment system will be implemented. The estimated present worth cost for this remedial action is $1,030,000 with present worth O&M cost of $510,000. If trigger levels are met or exceeded, the estimated present worth cost of the remedy would be $2,500,000.

PERFORMANCE STANDARDS OR GOALS: Not applicable unless chemical-specific action levels (based on MCLs) provided in the ROD are exceeded in ground water monitoring wells.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented to prevent the sale and future development of the site without further remedial action or consideration of impacts to public health and the environment. Access restrictions will include fencing.

KEYWORDS: Alternate Water Supply; Arsenic; Benzene; Chromium; Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLs: Metals; O&M; Organics; RCRA; State Regulations/Standards; Toluene; VOCs.

VOGEL PAINT & WAX, IA

First Remedial Action - Final
September 20, 1989

The Vogel Paint & Wax (VPW) site is a two-acre disposal area two miles southwest of the town of Maurice, in Sioux County, Iowa. Adjacent land uses are primarily agricultural; however, several private residences are within one-quarter mile of the site. An intermittent stream flows through the site and discharges to the West Branch Floyd River one mile away. A surficial sand and gravel aquifer underlies the site and supplies nearby private wells and the Southern Sioux County Rural Water System, located a mile and one half southeast of the site. Paint sludge, resins, solvents, and other paint manufacturing wastes were disposed of at the site between 1971 and 1979. The disposal area is on two acres of an 80-acre tract owned by VPW. Liquid wastes were poured into trenches along with filled or partially filled drums and other debris and capped with one to two feet of soil. VPW records indicate that approximately 43,000 gallons of aliphatic and aromatic hydrocarbons and 6,000 pounds of metals waste were buried at the site. The disposal area was covered with clay in 1984. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, and xylenes; and metals including chromium and lead.

The selected remedial action for this site includes excavation of contaminated soil and separation of solid and liquid wastes; onsite bioremediation of 3,000 cubic yards of the contaminated soil in a fully contained surface impoundment unit, or onsite thermal treatment if soil contains high metal content; stabilization of treated soil, if necessary to prevent leaching of metals, followed by disposal in the excavated area; offsite incineration, recycling or disposal of solid and liquid wastes; recycling of leachate and offsite treatment at POTW of excess leachate; ground water pumping and treatment using air stripping with discharge of treated water to a nearby stream; and ground water and air monitoring. VOC emissions to the atmosphere from both the soil and ground water cleanup actions will be controlled by carbon adsorption, if necessary. The estimated present worth cost for this remedial action is $1,851,000 which includes an annual O&M cost of $54,600.

PERFORMANCE STANDARDS OR GOALS: Soil treatment will achieve leaching standards and ground water will be treated to health-based levels. Ground water cleanup goals are based on SDWA MCLs/MCLGs or State action levels. Specific ground water cleanup levels include benzene 0.001 mg/l (State), toluene 2.0 mg/l (MCLG), xylenes 10.0 mg/l (MCLG), chromium 0.10 mg/l (MCL), and lead 0.005 mg/l (MCLG).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Biodegradation; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Decontamination; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Leachate Collection/Treatment; Leachability Tests; Lead; Metals; MCLs; MCLGs; O&M; Offsite Discharge; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; State Standards/Regulations; Soil; Solidification/Stabilization; Solvents; Toluene; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

RECORDS OF DECISION ABSTRACTS
REGION VIII
(Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)

BURLINGTON NORTHERN (SOMERS PLANT), MT
First Remedial Action - Final
September 27, 1989

The 80-acre Burlington Northern (Somers Plant) site is a former railroad tie treatment facility in Somers, Flathead County, Montana. Residential areas border the site on three sides and wetlands are located along Flathead Lake, 1,200 feet to the east, and in a slough area adjacent to the plant. Flathead Lake is currently the source of the Somers municipal drinking water supply. Burlington Northern operated the treatment plant from 1901 to 1986 and generated wastewater primarily consisting of stream condensate containing zinc chloride and creosote, which was discharged to a lagoon south of the treatment building. Overflow from the lagoon flowed through an open drainage ditch to a pond which formed in a swamp area adjacent to the ditch, and eventually into the lake. Contaminated soil and sediment areas in addition to the drainage ditch, swamp pond, and lagoon include a drippage area along the railroad tracks where treated ties were removed from the treatment building, a slough area where treated ties were stored, and a beach area extending into Flathead Lake. Ground water in the vicinity of the lagoon and the swamp pond is also contaminated. In May 1985 EPA performed an emergency removal action and removed approximately 3,000 cubic yards of contaminated soil and 100,000 gallons of contaminated water from the swamp pond and drainage ditch areas. The excavated areas were backfilled and covered, and excavated soil was transferred to an offsite RCRA-regulated facility to await treatment. Contaminated water was treated onsite to recover usable materials. The primary contaminants of concern affecting the soil, sediment, and ground water are organics including creosote constituents such as PAHs and phenols, and metals including zinc.

The selected remedial action for this site includes excavation and onsite biological treatment of 11,700 cubic yards of contaminated soil and sediment from all source areas except the beach area; onsite restoration or replacement of wetlands areas; installation and operation of an innovative hot water flushing system and a water treatment system using ozone/uv or peroxide/uv in the lagoon and swamp pond areas to treat creosote contaminated ground water, and in-situ biological treatment to degrade residual contaminants in the ground water and contaminants adsorbed onto the aquifer matrix; ground water will be reinjected or discharged to a POTW; ground water monitoring; and implementation of temporary institutional controls to restrict ground water use. The original estimated total present worth cost for this remedial action was $12,031,000, which included an annual O&M cost of $661,000 for years 1-2, $811,000 for years 3-10, and $72,000 for years 11-30. This present worth cost included remediation of beach sediment. Under the selected action, beach sediment are left in place. Reducing this cost by a volume ratio gives a current estimated present worth cost of approximately $11,000,000.

PERFORMANCE STANDARDS OR GOALS: Soil exceeding concentrations of cPAHs 3.6 mg/kg, total PAHs 1,875 mg/kg, zinc 15,750 mg/kg, or total phenols 3,000 mg/kg will be excavated. The established excavation levels for total cPAHs in soil is based on a 10^{-5} risk level. The initial soil treatment goal is based on a 10^{-4} risk level and will be achieved by reducing total cPAHs to 36 mg/kg (BDAT level). Treatment will be continued until the decrease in total PAHs has been less than 20 percent per year or background levels have been reached. The goal of the continued treatment is a risk level of 10^{-6}. Chemical-specific ground water cleanup goals are based on the risk assessment, CWA water quality criteria, and SDWA MCLs and include cPAHs

0.03 ug/l (WQC), total PAHs 0.30 ug/l (10^{-5} risk-based level), phenol 2,500 ug/l (WQC), benzene 5 ug/l (MCL), and zinc 110 ug/l (WQC).

INSTITUTIONAL CONTROLS: Institutional controls will be designed to prohibit construction of new wells downgradient from the contaminated aquifer until ground water quality returns to acceptable levels.

KEYWORDS: Biodegradation; Carcinogenic Compounds; Clean Water Act; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Metals; Onsite Discharge; Onsite Disposal; Onsite Treatment; O&M; Organics; PAHs; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Treatability Studies; Treatment Technology; Wetlands.

LIBBY GROUND WATER CONTAMINATION, MT

Second Remedial Action
December 30, 1988

The Libby Ground Water Contamination site (also known as the Champion Mill site or the Libby Pesticide site) is on the Champion International Corporation lumber and plywood mill in the city of Libby, Lincoln County, Montana. Champion is the third owner of the facility, which has been in operation since 1946. The area around the site includes residential areas and businesses. The site is bordered on the west by Flower Creek, on the east by Libby Creek, and on the north by the Kootenai River. The city and surrounding areas have a population of approximately 11,000. The contaminated soil/source area is within the confines of the facility; however, ground water contamination extends well into the city of Libby. Wood treating fluids and their constituents, including creosote and PCP, are the contaminants of concern at the site. They are found in soil and sediment at several different locations, including former waste pits, tank storage areas, and butt dip and treatment sites. The contamination is the result of spent fluids, overflow of treatment tanks, and spills. In addition to creosote and PCP, certain carrier fuels or oils were used at the site and contributed VOC contaminants. Investigations at the site were initiated by the State in 1979 after a residential well was found to smell of creosote. A ROD signed in September 1986 included a provision for an alternate water supply to residents whose wells were contaminated. The site has been divided into three operable units; however, they require concurrent remediation. The operable units are the soil/source area within the confines of the facility; the upper aquifer, historically used for drinking water and irrigation but currently severely contaminated; and the lower aquifer, highly contaminated with oil and non-aqueous phase liquids (NAPL). The primary contaminants of concern affecting the soil, sediment, and ground water at the site are VOCs including benzene; other organics including dioxin, PAHs (creosote constituents), and PCP; metals including arsenic; and oil.

The selected remedial actions for this site have been developed based on operable units. The selected remedial action for the soil/source area includes excavation and consolidation of approximately 30,000 cubic yards of unsaturated soil and debris in the waste pit area, followed by a two-step enhanced biodegradation process composed of enhanced natural biodegradation and subsequent transfer to a land treatment unit consisting of a 3.5-acre lined treatment cell for land farming and final deposition; in-situ bioremediation treatment of saturated soil in the waste disposal pit using a closed loop system involving ground water pumping and physical treatment in a fixed-bed bioreactor with reinjection through a rock percolation bed, and in-situ biodegradation stimulation to prevent further leaching of source material to ground water (recovered NAPLs will be processed in an oil/water separation and stored onsite for recycling and incineration); and capping of the waste pit, butt dip, and tank farm areas. The selected remedial action for the upper aquifer includes in-situ ground water bioremediation of the upper aquifer that is separate from the process used in the saturated zone of the waste pit area. The selected remedial action for the lower aquifer includes implementation of a pilot test for the oil-contaminated lower aquifer using biorestoration in conjunction with oil recovery and oil dispersion techniques (this is an interim remedy for the lower aquifer); implementation of institutional controls including deed, land use, and ground water restrictions; and onsite ground water monitoring. The estimated present worth cost of this remedial action is $5,777,000 with annual O&M costs of $670,200 for year 2, $521,200 for years 3-5, $232,200 for years 6-8, and $80,000 for years 9-30.

PERFORMANCE STANDARDS OR GOALS: Treatment of soil and debris will attain a total cPAHs level of 88 mg/kg based on a 10^{-5} risk level; napthalene 8.0 mg/kg, phenanthrene 8.0 mg/kg, pyrene 7.3 mg/kg, and PCP 37.0 mg/kg all based on best demonstrated available technology (BDAT) concentrations; and combined chlorinated dibenzo dioxins and dibenzo furans 0.001 mg/kg. Saturated zone (i.e., ground water below the waste pit area) and upper aquifer ground water treatment will attain total noncarcinogenic PAHs 400 ng/l, total cPAHs 40 ng/l, PCP 1.05 mg/l, benzene 5 ug/l (MCL), and arsenic 50 ug/l (MCL). Other organics/inorganics are not to exceed a 10^{-5} risk level. Treatment levels were not provided for the lower aquifer because an interim remedy is being used; therefore, an ARAR waiver is applicable.

INSTITUTIONAL CONTROLS: Remedy will implement deed, land use, and ground water use restrictions to prevent sale without acknowledgement of onsite hazardous wastes, future development, and the drilling of drinking water wells.

KEYWORDS: ARAR Waiver; Arsenic; Benzene; Biodegradation/Land Application; Capping; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Debris; Dioxin; Direct Contact; Drinking Water Supply; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; MCLs; Metals; O&M; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Temporary Storage; Treatability Studies; Treatment Technology; VOCs.

MONTICELLO VICINITY PROPERTIES, UT
First Remedial Action - Final
September 29, 1989

The Monticello Vicinity Properties site, also known as the Monticello Radiation Contaminated Properties, is a federally owned, abandoned vanadium and uranium mill area in the city of Monticello, San Juan County, Utah. Land use in the area is residential, however, there is limited commercial use as well. Milling of vanadium and uranium occurred from 1944 to 1960. Throughout the operating period, mill tailings were used in the city of Monticello for construction purposes, including fill for open lands; backfill around water, sewer, and electrical lines; sub-base for driveways, sidewalks, and concrete slabs; backfill against basement foundations; and as sand mix in concrete, plaster, and mortar. Currently, the site consists of a dismantled vanadium and uranium mill, and stabilized mill tailings piles. The Monticello Radiation Contaminated Properties were accepted into the Department of Energy's Surplus Facilities Management Program in 1980 for remedial action. The Vicinity Properties were formally included on the NPL in 1986 and, therefore, must comply with requirements of CERCLA. In October 1989 the millsite itself was also listed on the NPL. DOE established an official list of Vicinity Properties designated for remedial action based on radiological surveys conducted from 1971 to 1984. As of March 1989, 91 properties had been identified to be included in the Monticello Vicinity Properties. Of these 91 properties, 53 remedial actions have been completed and 12 additional properties are slated for remedial action in 1989. Approximately 100,000 cubic yards (135,000 tons) of contaminated construction debris and wind blown deposited contamination is estimated to be within the Vicinity Properties. The primary contaminants of concern in construction material and debris are thorium^{230}, radium^{226}, and radon^{222} contained in the vanadium and uranium mill tailings.

The selected remedial action for this site includes excavation and removal of residual radioactive material from affected properties and restoration/reconstruction using clean materials, or modification of existing structures to isolate radiation sources from inhabitants; filling and regrading excavated areas; and disposal and temporary storage of all contaminated material at the Monticello Millsite. The millsite is addressed separately under a 1988 Federal Facilities Inter-agency Agreement. The estimated average cost of this remedial action is $65,000 per Vicinity Property for 91 "included" properties, or $5,915,000.

PERFORMANCE STANDARDS OR GOALS: Cleanup will ensure that the concentration of radium^{226} in land averaged over 100 square meters shall not exceed the background level of 2 pCi/g by more than 5 pCi/g averaged over the first 15 cm of soil or 15 pCi/g averaged over 15 cm thick layers of soil more than 15 cm below the surface. In addition, in an occupied or habitable building the level of gamma radiation shall not exceed background by more than 20 microroentgens per hour. These goals are based on the Uranium Mill Tailings Radiation Control Act of 1978.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Debris; Direct Contact; Excavation; Filling; Metals; Mining Wastes; Onsite Containment; Radioactive Materials; Soil; State Standards/Regulations; Treatment Technology.

SAND CREEK INDUSTRIAL, CO

First Remedial Action
September 29, 1989

The Sand Creek Industrial site is in Commerce City, Adams County, Colorado. Land use in the vicinity of the site is industrial with users including trucking firms, petroleum and chemical production and supply companies, small businesses and several residences. The site contains the property and buildings of the Colorado Organic Chemical Company (COC) and approximately 13 residences. Production wells north and downgradient of the study area are the source of water supply to the county. Pesticide manufacturing operations began at COC in the 1960s. Fires in 1968 and 1977 and improper pesticide storage practices resulted in high levels of organiphosphate pesticides, chlorinated hydrocarbons, and thermally-altered pesticides being released at the site. In 1978 COC removed some contaminated soil, and in 1984 COC removed drums of waste, excess product, and contaminated soil, and installed fencing at the site in response to an EPA order. This Record of Decision represents the first of five planned operable units for the site and addresses soil, buildings, and tanks contaminated by pesticides, volatile organics, and metals. The primary contaminants of concern affecting the soil, onsite buildings, and tanks are VOCs including TCE and PCE; and other organics including pesticides.

The selected remedial action for the site includes in-situ vacuum extraction to remove VOCs from contaminated soil and onsite treatment of off-gas by air stripping; excavation and offsite incineration of approximately 1,000 cubic yards of soil contaminated with greater than 1000 mg/kg halogenated organic compounds (HOC), with offsite residual disposal in a RCRA landfill; backfilling of excavated areas with clean soil; demolition and offsite disposal of buildings in conformance with land disposal regulations; and ground water monitoring at the site for 30 years following remediation. The estimated present worth cost for the selected remedy is $5,349,600.

PERFORMANCE STANDARDS OR GOALS: Acceptable site-specific soil concentrations (action levels) were calculated for VOCs using a soil-water leaching model which assumed ground water concentrations corresponding to SDWA MCLs or a 10^{-6} cancer risk level. Chemical-specific cleanup levels were provided for PCE 1,095 ug/kg and TCE 285 ug/kg. ARARs specify the cleanup objectives for the pesticide 2, 4-D, a HOC. LDRs have established treatment of HOCs $\geq$ 1,000 mg/kg based on BDAT, which for 2,4-D is incineration.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Clean Closure; Clean Water Act; Closure Requirements; Debris; Direct Contact; Excavation; Filling; Ground Water Monitoring; Incineration/Thermal Treatment; MCLs; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PCE;

Pesticides; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs.

WOODBURY CHEMICAL, CO

Second Remedial Action - Final

September 29, 1989

The Woodbury Chemical site is in Commerce City, a northern suburb of Denver, Colorado, and neighbors a primarily industrial area which includes automobile salvage yards and a petroleum refinery. From the 1950s to 1971, the Woodbury Chemical Company operated a pesticide formulation facility which was destroyed by fire in 1965 but was subsequently rebuilt. Contaminated rubble and debris from the fire were disposed of on a 2.2-acre vacant lot east of the Woodbury facility. During a 1985 remedial investigation of the 2.2-acre lot, EPA identified high levels of pesticides and metals in surface and subsurface soil. Although EPA issued a ROD later that year, site cleanup was delayed due to the discovery of significant additional contamination at the Woodbury facility and adjacent properties to the west and north of the facility. As a result of the discovery of additional contamination, EPA determined it would be more cost effective to simultaneously implement the cleanup activities at the 2.2-acre lot, the Woodbury chemical facility, and adjacent properties. The selected remedial action addressed in this ROD incorporates and builds upon the 1985 ROD. The primary contaminants of concern affecting the soil are VOCs including PCE and TCE; other organics including pesticides; and metals including arsenic.

The selected remedial action for this site includes excavation and offsite incineration of 850 cubic yards of highly-contaminated soil followed by offsite disposal; excavation and offsite disposal of 11,520 cubic yards of less-contaminated soil at a RCRA-permitted landfill; and backfilling and revegetating the excavated area. The estimated present worth cost for this remedial action is $6,962,600 which includes an annual O&M cost of $31,400.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain an excess lifetime cancer risk of 10^{-6}. Specific cleanup goals are based on ARARs and background levels and include arsenic 5-10 mg/kg, TCE 0.52 mg/kg, and PCE 1.9 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Clean Air Act; Direct Contact; Excavation; Filling; Incineration/Thermal Destruction; Metals; Offsite Disposal; Offsite Treatment; O&M; Organics; PCE; Pesticides; RCRA; Soil; State Standards/Regulations; TCE; Treatment Technology; VOCs.

RECORDS OF DECISION ABSTRACTS
REGION IX
(American Samoa, Arizona, California, Guam, Hawaii,
Nevada, Trust Territories)

ATLAS ASBESTOS MINE, CA
First Remedial Action
July 19, 1989

The Atlas Asbestos Mine site is in Fresno County, California, and is being remediated concurrently with the Coalinga Asbestos Mine site. This ROD does not address the mines, but rather a separate area in the city of Coalinga, where asbestos, from the Atlas-Coalinga mines, was deposited to await handling and shipment. This 107-acre site has been designated as the first operable unit for the Atlas Asbestos Mine and the Coalinga Asbestos Mine sites. From the 1960s to the mid-1970s extensive asbestos mining and milling took place in areas near the site, and until 1980 the site operated as an asbestos milling, manufacturing, storage, and transportation center. The site consists of four distinct areas: (1) the warehouse which was once a mining waste distribution center and which currently houses 1,600 cubic yards of mining waste; (2) a storage yard which contains asbestos- contaminated stacked pipes; (3) a shipping yard which was used as an asbestos distribution center by the Atlas Asbestos Company; and (4) the U.S. Asbestos Company which currently stores piles of asbestos-contaminated mining waste. In 1980 a State inspection revealed elevated levels of asbestos in the nearby aqueduct, which suggested that the Atlas Asbestos Mine and Coalinga Asbestos Mine sites were probable asbestos sources. Subsequent sampling programs, conducted between 1983 and 1987, revealed that surface water and air also contained elevated levels of asbestos. As a result of these findings, EPA issued an Administrative Order to a major landowner, Southern Pacific Transportation Company (SPTC), requiring SPTC to conduct an additional remedial investigation and a feasibility study and to perform interim measures to stabilize the site. Because airborne emissions of asbestos pose the greatest threat to neighboring residents, this remedial response will limit the amount of asbestos and nickel released from the soil and emitted into the air. The primary contaminants of concern affecting the soil and debris are metals including nickel, and other inorganics including asbestos and mining wastes.

The selected remedial action for this site includes excavating and consolidating 14,500 cubic yards of asbestos, chromium, and nickel-contaminated soil and building debris; constructing an underground waste management unit (WMU) to contain and dispose of contaminated soil and waste onsite; capping the WMU area; regrading the excavated area; decontaminating debris; monitoring soil moisture content, ground water, air, and personnel; and implementing institutional controls. The estimated present worth cost for this action ranges between $1,500,000 to $2,500,000, which includes annual O&M costs of $35,000.

PERFORMANCE STANDARDS OR GOALS: All contaminated soil and mining wastes will be cleaned to, or below, background levels for nickel, and to, or below, one area percent asbestos using polarized light microscopy.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent disturbing the cap and to prevent releasing asbestos fibers or nickel contaminants into the air.

KEYWORDS: Air Monitoring; Asbestos; Capping; Carcinogenic Compounds; Clean Air Act; Debris; Decontamination; Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; Metals; Mining Wastes; O&M; Onsite Containment; Onsite Disposal; Soil; State Standards/Regulations; Toxic Substances Control Act.

BECKMAN INSTRUMENTS (PORTERVILLE), CA
First Remedial Action - Final
September 26, 1989

The Beckman Instruments (Porterville) site, which includes the Beckman plant and surrounding study area, is in the city of Porterville, California. The 12-acre Beckman plant has manufactured electronic instrument assemblies and circuit boards since 1967. Wastewater from industrial processes, including electroplating and degreasing, contains spent halogenated solvents, inorganic and acidic solutions, salts, metal-laden solutions, and plating bath sludges. From 1974 to 1983, wastewater was discharged to an onsite solar evaporation pond; however, since 1983, wastewater has been treated onsite. Ground water in the vicinity of the pond was used for domestic and agricultural purposes until 1983 when ground water was found to be contaminated. Beckman subsequently closed the pond, provided alternate water supplies to approximately 300 residents in the area, and began ground water pumping and treatment using air stripping in 1985. Additionally, soil beneath the former pond, as well as near a former pesticide operation area, are known to be contaminated with elevated levels of lead. The primary contaminants of concern affecting the soil and ground water are VOCs including TCE and metals including lead.

The selected remedial action for this site includes excavation and offsite disposal of lead-contaminated soil; continued operation of the ground water pumping and treatment system for the upper aquifer; pumping and treatment of ground water from upper aquitard and lower aquifer using air stripping; offsite discharge of all treated water into infiltration basins or irrigation canals; and ground water monitoring. The estimated present worth cost for the selected remedy is $4,740,000. This estimate does not include costs for continued operation of the existing pumping and treatment system.

PERFORMANCE STANDARDS OR GOALS: Soil contaminated with lead above 200 mg/kg will be excavated and disposed of offsite. Ground water cleanup will attain State or Federal MCLs or State action levels. Chemical-specific ground water cleanup goals include TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; Offsite Disposal; Offsite Discharge; O&M; Onsite Treatment; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; VOCs.

COALINGA ASBESTOS MINE, CA
First Remedial Action
July 19, 1989

The Coalinga Asbestos Mine site is in Fresno County, California, and is being remediated concurrently with the Atlas Asbestos Mine site. This ROD does not address the mines, but rather a separate area in the city of Coalinga, where asbestos, from the Atlas-Coalinga mines, was deposited to await handling and shipping. This 107-acre site has been designated as the first operable unit for the Atlas Asbestos Mine and the Coalinga Asbestos Mine sites. From the 1960s to the mid-1970s extensive asbestos mining and milling took place in areas near the site, and until 1980 the site operated as an asbestos milling, manufacturing, storage, and transportation center. The site consists of four distinct areas: (1) the warehouse which was once a mining waste distribution center and which currently houses 1,600 cubic yards of mining waste; (2) a storage yard which contains asbestos-contaminated stacked pipes; (3) a shipping yard which was used as an asbestos distribution center by the Coalinga Asbestos Company; and (4) the U.S. Coalinga Company which currently stores piles of asbestos-contaminated mining waste. In 1980 a State inspection revealed elevated levels of asbestos in the nearby aqueduct which suggested that the Coalinga Asbestos Mine and Atlas Asbestos Mine sites were probable asbestos sources. Subsequent sampling programs, conducted between 1983 and 1987, revealed that surface water and air also contained elevated levels of asbestos. As a result of these findings, EPA issued an Administrative Order to a major landowner, Southern Pacific Transportation Company (SPTC), requiring SPTC to conduct an additional remedial investigation and a feasibility study and to perform interim measures to stabilize the site. Because airborne emissions of asbestos pose the greatest threat to neighboring residents, this remedial response will limit the amount of asbestos and nickel released from the soil and emitted into the air. The primary contaminants of concern affecting the soil and debris are metals including nickel, and other inorganics including asbestos and mining wastes.

The selected remedial action for this site includes excavating and consolidating 14,500 cubic yards of asbestos, chromium, and nickel-contaminated soil and building debris; constructing an underground waste management unit (WMU) to contain and dispose of contaminated soil and waste onsite; capping the WMU area; regrading the excavated area; decontaminating debris; monitoring soil moisture content, ground water, air, and personnel; and implementing institutional controls. The estimated present worth cost for this action ranges between $1,500,000 to $2,500,000, which includes annual O&M costs of $35,000.

PERFORMANCE STANDARDS OR GOALS: All contaminated soil and mining wastes will be cleaned to, or below, background levels for nickel, and to, or below, one area percent asbestos using polarized light microscopy.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent disturbing the cap and to prevent releasing asbestos fibers or nickel contaminants into the air.

KEYWORDS: Air Monitoring; Asbestos; Capping; Carcinogenic Compounds; Clean Air Act; Debris; Decontamination; Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; Metals; Mining Wastes; O&M; Onsite Containment; Onsite Disposal; Soil; State Standards/Regulations; Toxic Substances Control Act.

COAST WOOD PRESERVING, CA
First Remedial Action - Final
September 29, 1989

The ROD was not available at the time of printing; however, the ROD was included in Exhibits 1-12, as appropriate, based on information obtained from the Region.

FAIRCHILD SEMICONDUCTOR (MT.VIEW), CA
First and Second Remedial Actions - Final
June 9, 1989 - June 30, 1989

The Fairchild Semiconductor (Mt. View) site is one of three Superfund sites that are being remediated concurrently. The other two sites are Intel (Mountain View Plant) and Raytheon. The sites are located in the Middlefield/ Ellis/Whisman (MEW) Study Area in Santa Clara County in the city of Mountain View, California. Land use in the area is primarily light industrial and commercial, with some residential areas. There are no natural surface drainage features within or surrounding the site; most of the runoff is intercepted by a storm drain system and discharged to an offsite creek. Various industrial activities were conducted in the vicinity of the site, including semiconductor manufacturing, metal finishing operations, parts cleaning, aircraft maintenance, and other activities requiring the use, storage, and handling of a variety of chemicals, particularly solvents. Site investigations at several of these facilities during 1981 and 1982 revealed significant soil and ground water contamination by toxic chemicals, primarily VOCs. The primary cause of the contamination was leaking storage tanks and lines, and poor management practices. Before and during additional site investigations, which were conducted under a 1985 Consent Order, interim cleanup activities were conducted at the site by Fairchild, Intel, and Raytheon. These included tank removals, soil removal and treatment, well sealing, construction of slurry walls, and hydraulic control and treatment of local ground water. The primary contaminants of concern affecting the site are VOCs including TCE, TCA, PCE, toluene, and xylenes, and other organics including phenols.

The selected remedy for this site includes in-situ vapor extraction with treatment by vapor phase GAC of contaminated soil found within the Fairchild and Raytheon slurry walls. There may be some limited soil excavation and treatment by aeration for some areas outside of the slurry walls, with onsite disposal of residues in the excavated area; ground water pumping and treatment using air stripping, and in some cases liquid phase GAC, with emissions controls consisting of GAC vapor phase carbon units, followed by reuse of the ground water (reuse options including reinjection are being developed) and, if necessary, discharge to surface water; sealing of any conduits or potential conduits to protect the deep aquifer; and ground water monitoring. The present worth cost for this remedial action is $49,000,000 to $56,000,000, which includes O&M costs.

PERFORMANCE STANDARDS OR GOALS: The cleanup goals for soil are based on ensuring the success of the ground water cleanup goal (attaining MCLs) in the shallow aquifers. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. Ground water cleanup goals for the shallow aquifers, which are not currently used for drinking water, are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL). Goals for the deep aquifers, which are used for drinking water, are based on a 10^{-6} cumulative cancer risk and include TCE 0.8 ug/l. Attainment of these levels will also assure cleanup of other VOCs to at least their respective MCLs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Monitoring; Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Phenols; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Volatilization/Soil Aeration; Xylenes.

FAIRCHILD SEMICONDUCTOR (S. SAN JOSE), CA

First Remedial Action - Final
March 20, 1989

The Fairchild Semiconductor (S. San Jose) site is a former semiconductor manufacturing facility in San Jose, California. Operations were conducted at the site from April 1977 until it closed in October 1983. In late 1981, Fairchild Semiconductor Corporation discovered that an underground organic solvent waste tank had failed, resulting in soil and on- and offsite ground water contamination by a mixture of solvents. TCA contamination was discovered exceeding drinking water standards in a public drinking water supply well located approximately 1,800 feet downgradient from the site. The well was subsequently destroyed and sealed; however, several wells remain active downgradient. Fairchild has been investigating and cleaning up soil and ground water pollution at the facility since contamination was first detected in 1981. Interim actions taken by Fairchild include source removal and onsite soil cleanup (removal of defective tank and excavation of 3,389 cubic yards of contaminated soil), installation of a slurry wall around the perimeter of the site, conducting pilot studies for onsite aquifer flushing and in-situ soil vapor extraction, hydraulic containment of the plume with onsite and limited offsite ground water treatment using air stripping, and implementation of ground water conservation measures. Although the interim cleanup actions have significantly decreased the size and contamination of the plume, some areas outside the slurry wall still exceed State drinking water action levels, and onsite soil and ground water still contain high concentrations of chemicals. This ROD provides a final remedy which addresses onsite soil and ground water, and offsite ground water contamination. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCA, DCE, and xylenes.

The selected remedial action for this site includes onsite soil vapor extraction (aeration); onsite shallow ground water, and offsite ground water from well RW-25, pumping and treatment using air stripping, followed by offsite reinjection of treated ground water and discharge to surface water after aquifer reuse capacity has been exhausted; deep ground water pumping followed by discharge of untreated ground water to surface water via storm drains; conducting laboratory and field study of biodegradation of onsite chemicals; implementing institutional controls including deed restrictions to limit ground water and land use; and ground water monitoring. The estimated present worth cost for this remedial action is $9,393,100 which includes total O&M costs of $7,231,700.

PERFORMANCE STANDARDS OR GOALS: The soil remediation goal is 1 mg/kg for VOCs including PCE, TCA, and xylenes. This goal will be re-evaluated based on treatability test results. Offsite ground water will attain a hazard index of 0.25, which will be achieved by reducing DCE concentrations to below detection (i.e., <1ppb) and TCA concentrations to 25 ppb. Onsite ground water cleanup goals are provided for the seven contaminants of concern. Individual goals based on DHS drinking water action levels or MCLs, whichever is more stringent, include TCA 200 ug/l, DCE 6 ug/l, and xylenes 620 ug/l. Other cleanup levels were based on proposed State MCLs or the oral reference dose in the IRIS and include PCE 2 ug/l (proposed State MCL).

INSTITUTIONAL CONTROLS: Implementation of deed restrictions to restrict land and ground water use and protect the integrity of the slurry wall.

KEYWORDS: Air Stripping; Direct Contact; Drinking Water Supply; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Offsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs; Volatilization/ Soil Aeration; Xylenes.

FIRESTONE TIRE (SALINAS PLANT), CA

First Remedial Action
September 13, 1989

The 256-acre Firestone Tire (Salinas Plant) site is in an agricultural area in Salinas, California. The facility was operated as a tire manufacturing plant from 1963 to 1980, in which a variety of chemicals and chemical formulations were used including solvents and surfactants. In 1983, as part of the requirements for the closure of a RCRA-regulated storage area at the facility, Firestone conducted an environmental investigation and determined that some chemicals had been released to the soil and ground water. Sampling indicated that a plume of VOC-contamination extends about 2 1/2 miles northwest of the former facility. Consequently, onsite and offsite ground water pumping and treatment was initiated to further reduce chemical migration. Furthermore, evaluation of potential sources of contamination resulted in cleaning and removing storage tanks and above-ground facilities, as well as excavating 5,300 cubic yards of inorganic- and organic-contaminated soil for final disposition offsite. This final remedy provides for additional cleanup of ground water under the site and as much as 2 1/2 miles from the site. Soil analytical data indicated that the residual risk from soil contamination after remedial measures had been implemented warranted no further soil remediation. The primary contaminants of concern affecting the ground water are VOCs including 1,1-DCA, 1,1-DCE, 1,1,1-TCA, TCE, PCE, benzene, toluene, and xylenes.

The selected remedial action for the site includes pumping and treatment of ground water at the existing treatment facility using carbon adsorption and air stripping, with offsite discharging of treated ground water to surface water; ground water monitoring to ensure that the ground water plume is declining; crop testing to ensure that there is no plant uptake of the contaminants; and developing a contingency plan for water in the deep aquifer in case of contamination. The estimated present worth cost for this remedial action is $1,742,000, which includes an estimated O&M cost of $1,517,000 for 3 1/2 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for ground water will be based on chemical-specific ARARs, a cumulative health index of 1 for noncarcinogens, or a carcinogenic risk of 10^{-6} depending on which is more stringent. Chemical-specific goals include benzene 0.7 ug/l (State), 1,1-DCA 5.0 ug/l (State), TCE 3.2 ug/l

(10^{-6} risk level), PCE 0.7 ug/l (10^{-6} risk level), 1,1-DCE 6.0 ug/l (HI=1), toluene 20 ug/l (HI=1), and xylene 70 ug/l (HI=1).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Organics; PCE; Plume Management; Solvents; State Permit; State Standards/Regulations; TCE; VOCs; Xylenes.

IBM (SAN JOSE PLANT), CA
First Remedial Action - Final
December 15, 1988

International Business Machines (IBM) owns and operates a data processing machine manufacturing facility in the Santa Teresa Basin in San Jose, California. IBM has operated the facility since December 1956 using organic chemicals including TCA, acetone, xylenes, and petroleum naphthas. The organic chemicals have been handled and stored onsite in drums, and aboveground and underground tanks. In addition, waste organic solvents were stored in concrete or steel underground tanks or drums; however, the concrete tanks were designed only to store organic wastes. In October 1980, while excavating tanks in Tank Farm No. 1, IBM discovered soil contaminated with organics. Investigations in November 1981 revealed extensive ground water contamination. The ground water plume is more than 3 miles long and more than 180 feet deep. Fourteen active or potentially active water supply wells are downgradient of the plume; however, none of these public wells has been found to contain VOCs above State and Federal drinking water standards. Nineteen sources of soil and ground water contamination have been identified, including tank overflows, spillage from drum handling, and tank and pipeline fitting failures. Actions have been taken to prevent further solvent migration from the IBM source areas, including removing underground storage tanks which were replaced with aboveground tanks, and excavating more than 23,000 cubic yards of contaminated soil. Interim remedial measures begun in November 1982 to clean up the plume have included off- and onsite ground water pumping with discharge of untreated ground water to storm drains. The primary contaminants of concern affecting the soil and ground water are VOCs including TCA, toluene, and xylenes, and other organics.

The selected remedial action for this site includes onsite soil vapor extraction; onsite shallow and deep ground water, and offsite deep ground water, pumping and treatment using air stripping, followed by onsite discharge of treated ground water to the aquifer and offsite discharge to surface water after the reuse capacity of the aquifer is exhausted. Remedial action costs for this remedy were not provided.

PERFORMANCE STANDARDS OR GOALS: The soil remediation goal is 1 mg/kg for all contaminants of concern. Ground water treatment goals were provided for contaminants of concern in the upper and lower aquifers. The chemical-specific goals for ground water are based on State action levels, EPA reference doses, and lifetime health advisories. Individual goals include TCA 200 ug/l (State), toluene 100 ug/l (State), and xylenes 200 ug/l (State) in the upper aquifer zone, and a hazard index of 0.25 with TCA 50 ug/l in the deeper aquifer zones.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Treatment; Offsite Discharge; Onsite Discharge; Onsite Treatment; Organics; Safe Drinking Water Act; Soil; Solvents; State Permit; State Standards/Regulations; Toluene; Vacuum Extraction, VOCs; Xylenes.

INTEL (MOUNTAIN VIEW PLANT), CA
First Remedial Action - Final
June 9, 1989

The Intel (Mountain View Plant) site is one of three Superfund sites that are being remediated concurrently. The other two sites are Fairchild

Semiconductor (Mt. View) and Raytheon. The sites are located in the Middlefield/Ellis/Whisman (MEW) Study Area in Santa Clara County in the city of Mountain View, California. Land use in the area is primarily light industrial and commercial, with some residential areas. There are no natural surface drainage features within or surrounding the site; most of the runoff is intercepted by a storm drain system and discharged to an offsite creek. Various industrial activities were conducted in the vicinity of the site, including semiconductor manufacturing, metal finishing operations, parts cleaning, aircraft maintenance, and other activities requiring the use, storage, and handling of a variety of chemicals, particularly solvents. Site investigations at several of these facilities during 1981 and 1982 revealed significant soil and ground water contamination by toxic chemicals, primarily VOCs. The primary causes of the contamination were leaking storage tanks and lines, and poor management practices. Before and during additional site investigations, which were conducted under a 1985 Consent Order, interim cleanup actions were conducted at the site by Fairchild, Intel, and Raytheon. These included tank removals, soil removal and treatment, well sealing, construction of slurry walls, and hydraulic control and treatment of local ground water. The primary contaminants of concern affecting the site are VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenols.

The selected remedy for this site includes in-situ vapor extraction with treatment by vapor phase GAC of contaminated soil found within the Fairchild and Raytheon slurry walls. There may be some limited soil excavation and treatment by aeration for some areas outside of the slurry walls with onsite disposal of residues in the excavated area; ground water pumping and treatment using air stripping, and in some cases liquid phase GAC, with emissions controls consisting of GAC vapor phase carbon units, followed by reuse of the ground water (reuse options including reinjection are being developed) and, if necessary, discharge to surface water; sealing of any conduits or potential conduits to protect the deep aquifer; and ground water monitoring. The present worth cost for this remedial action is $49,000,000 to $56,000,000, which includes O&M costs.

PERFORMANCE STANDARDS OR GOALS: The cleanup goals for soil are based on ensuring the success of the ground water cleanup goal (attaining MCLs) in the shallow aquifers. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. Ground water cleanup goals for the shallow aquifers, which are not currently used for drinking water, are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL). Goals for the deep aquifers, which are used for drinking water, are based on a 10^{-6} cumulative cancer risk and include TCE 0.8 ug/l.

Attainment of these levels will also ensure cleanup of other VOCs to at least their respective MCLs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Monitoring; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Criteria; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Phenols; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Volatilization/Soil Aeration; Xylenes.

KOPPERS (OROVILLE PLANT), CA

First Remedial Action - Final
September 13, 1989

The Koppers (Oroville Plant) site is a 200-acre operating wood treating plant in Butte County, California, just south of Oroville. The site is bordered on the west by a Louisiana-Pacific Corporation facility, which is also a Superfund site, and lies within the floodplain of the Feather River, which runs 3,000 feet to the east. Land use in the vicinity of the site is mixed agricultural, residential, commercial, and industrial. Although there is a history of wood treating operations at the site, wood treating operations were greatly expanded in 1955 when Koppers Company, Inc. became the owner and operator. Chemical preservatives including pentachlophenol (PCP), creosote, and chlorinated copper arsenate solution have been used in the wood treating processes. Wastewater discharge and other site activities have resulted in contamination of unlined ponds, soil, and debris. In 1971 PCP was detected in onsite ground water and, in 1972, in residential wells to the southwest. Pursuant to a State order, Koppers conducted cleanup activities from 1973 to 1974, including ground water pumping and discharging to spray fields and offsite disposal of contaminated debris, and process changes, including construction of a wastewater treatment plant. In 1986 Koppers provided an alternate water supply for domestic uses to affected residents. In 1987 an explosion and fire occurred at a PCP wood treatment process facility prompting EPA to issue a removal order requiring cleanup of fire debris, and removal and stabilization of surface soil. This ROD addresses the remaining contamination in onsite soil, and ground water affected by site contamination. The primary contaminants of concern affecting the soil and ground water are VOCs including toluene, xylenes, and benzene; other organics including PAHs, PCP, and dioxins/furans; and metals including arsenic and chromium.

The selected remedial action for this site includes a soil component and a ground water component. The soil remedy includes four discrete soil treatment areas: in-situ biodegradation of 110,000 cubic yards of PCP-contaminated soil; excavation and soil washing of 200,000 cubic yards of soil contaminated with wood treating wastes with redisposal of treated soil onsite and treatment of residual contamination in the washing fluid in an onsite treatment facility; installation of a low permeability cap over the wood treating process area and downgradient extraction wells with future treatment of 20,000 cubic yards of contaminated soil beneath this area as soil becomes accessible during equipment change or ceasing of operations; and excavation and chemical fixation of 4,000 cubic yards of soil contaminated with metals, followed by onsite disposal. The ground water remedy includes pumping and treatment of approximately 22,000,000 cubic yards of ground water using activated carbon, and reinjecting the treated waste to the ground water; and formalizing the provision for an existing alternate water supply and extending, if needed, the water supply during implementation of the remedy. The estimated present worth cost for this remedial action is $77,700,000, which includes an estimated present worth O&M cost of $37,100,000.

PERFORMANCE STANDARDS OR GOALS: The soil cleanup goals for the major contaminants at the site are PCP 17 mg/kg, dioxin/furans 0.030 ug/kg, background for arsenic and chromium, and cPAHs 0.19 mg/kg. Soil goals were set to meet 10^{-6} cancer-risk targets. Remedial objectives for ground water are the more stringent of 10^{-6} cancer risks or State action levels. Specific goals include PCP 2.2 ug/l, cPAHs 0.007 ug/l, dioxins 0.00000053 ug/l or the lowest available detection limit, and background levels for arsenic and chromium.

INSTITUTIONAL CONTROLS: Not specified.

KEYWORDS: Alternate Water Supply; Arsenic; Background Levels; Benzene; Biodegradation/Land Application; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Dioxin; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Leachability Tests; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; Solidification/Stabilization; State Permit; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

LITCHFIELD AIRPORT AREA, AZ

Second Remedial Action - Final
September 26, 1989

The Litchfield Airport site, also known as the Phoenix-Goodyear Airport Area site, covers approximately 35 square miles and, except for the airport, is almost entirely in the city of Goodyear. The surrounding area is primarily agricultural, however, residential development is anticipated in the near future. A ground water divide running under the area effectively divides the site into a northern and southern area. Between 1981 and 1983, the State discovered that the ground water was contaminated with solvents, metals, and

VOCs. Sampling data identified contaminated areas in the northern and southern portions of the site due to onsite industrial activities and waste handling by the former Goodyear Aerospace Corporation (GAC), the former Litchfield Park Naval Air Facility, and UniDynamics, Phoenix, Inc. A 1987 ROD addressed ground water in an area of the southern portion of the site contaminated with VOCs. This ROD addresses soil (vadose zone) and ground water remediation for the remainder of the site, with the exception of chromium-contaminated soil in the sludge drying beds at the former GAC facility. GAC owners are currently performing an expedited response action under an Administrative Order on Consent for the chromium sludge beds. The primary contaminants of concern affecting the soil and ground water are VOCs including TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead.

The selected remedial action for the northern portion of the site includes treatment of soil using soil vapor extraction (SVE) to remove 99% of contaminants; and ground water pumping and treatment using air stripping, liquid phase granular activated carbon, and granular activated carbon polishing on the air emissions, followed by reinjection or discharge of treated ground water to the municipal water system. Remedial activities for the southern portion of the site include treatment of 284,100 square yards of VOC-contaminated soil using SVE; and ground water pumping and treatment using air stripping and wellhead treatment, followed by discharge to the municipal water system. The estimated present worth cost for this remedial action ranges between $30,227,000 and $31,693,000. O&M costs will be determined during the remedial design.

PERFORMANCE STANDARDS OR GOALS: VOC- and metal-contaminated soil outside of the sludge pits will be removed until remaining levels will not cause or contribute to ground water contamination in concentrations exceeding ground water cleanup standards. Ground water cleanup goals are based on SDWA MCLs, State action levels (SALs) or CWA Ambient Water Quality Cirteria (AWQC). Chemical-specific ground water cleanup goals include toluene 340 ug/l (SAL), TCE 5 ug/l (MCL), xylenes 440 ug/l (SAL), arsenic 50 ug/l (MCL), chromium 50 ug/l (MCL), and lead 50 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Ground Water; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Discharge; Onsite Treatment; Plume Management; Publicily Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; State Standards Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Xylenes.

NINETEENTH AVENUE LANDFILL, AZ

First Remedial Action - Final
September 29, 1989

The 213-acre Nineteenth Avenue Landfill is in an industrial area of Maricopa County, Phoenix, Arizona. The landfill is divided by the Salt River channel into two sections or cells. A 200-acre section, Cell A, lies north of the channel and a 13-acre section, Cell A-1, lies south of the channel. State permitted landfill operations were conducted from 1957 to 1979 during which time approximately nine million cubic yards of municipal refuse, solid and liquid industrial wastes, and some medical wastes and materials containing low levels of radioactivity were deposited in the landfill. Sampling of the landfill contents has revealed no concentrated sources of contamination, however, the State ordered the landfill closed in 1979 due to the periodic inundation of the landfill by flood waters from the Salt River Channel. Subsequently, the city covered the site with fill, stockpiled soil for final capping, installed ground water monitoring wells, built berms around the landfill, and installed a methane gas collection system. This remedial action is designed to mitigate threats resulting from flooding of the landfill, which has occurred intermittently since 1965. The primary contaminants of concern in the soil/refuse include VOCs such as toluene and xylenes. There is little risk to public health from ground water pathways because ground water contaminants are of small magnitude, and only limited migration has occurred off the site.

The selected remedial action for this site includes containing landfill wastes onsite by constructing an impermeable cap and surface drainage structures over the landfill, as well as soil-cement levees along the river at the landfill boundary; widening the river channel; collecting and flaring landfill generated gases; institutional controls and access restrictions; and air and ground water monitoring. A contingency ground water treatment plan will be implemented whenever ground water standards are exceeded at the landfill boundary. The estimated present worth cost for this remedial action is $42,990,000, which includes an annual O&M cost of $1,010,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Not applicable to landfill wastes. Ground water currently does not pose a risk to human health or the environment. If monitoring detects concentrations exceeding SDWA MCLs at the property boundary a contingency plan will be implemented.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented but were not specified.

KEYWORDS: Air; Air Monitoring; Capping; Contingent Remedy; Ground Water; Ground Water Monitoring; Institutional Controls; Levees; MCLs; O&M; Onsite Containment; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Collection/Diversion.

PURITY OIL SALES, CA
First Remedial Action
September 26, 1989

The seven-acre Purity Oil Sales site is in Fresno County, California, one-half mile south of the Fresno city limits. The site is located in a predominantly industrial area; however, there are adjacent residential properties, including three houses and a trailer park. The ground water aquifer in the Fresno area has been designated as a sole-source aquifer. The shallow aquifer underlying the site is probably hydrogeologically connected with deeper aquifer zones providing the domestic water supply for Fresno and the surrounding area. The Purity site operated as a used oil recycling facility from 1934 to the early 1970s. In 1976 a fire destroyed the main warehouse building. Equipment remaining, with the exception of seven steel above-ground storage tanks, was removed from the site, and the area was partially regraded. One of the remaining storage tanks is lined with asbestos. Waste pits filled with soil, debris, and rubble cover most of the site. The State conducted a remedial investigation in 1982 during which time the EPA Emergency Response Team removed 1,800 cubic yards of hazardous oily and tarry materials from the site. This first of two planned operable units addresses the cleanup of the ground water and the removal and offsite disposal of storage tanks and tank contents. A future ROD will address contaminated soil. The primary contaminants of concern affecting ground water are VOCs including benzene and TCE; and metals. Contaminants of concern in the tank sludge are VOCs including benzene, toluene and xylenes; other organics including PCBs, PAHs, pesticides, and phenols; and metals including lead.

The selected remedial action for this site includes ground water pumping and onsite treatment with greensand to remove metals and air stripping to remove VOCs; disposal of treated ground water by either reinjection into the aquifer, disposal in a canal, or disposal in local infiltration basins; provision of an alternate water supply to affected private well owners; creation of a ground water management zone to maintain ground water levels; ground water monitoring; removal, onsite solidification (if necessary), and offsite disposal of 22,500 gallons of contaminated sludge from the seven onsite steel tanks; and cleaning, dismantling, and offsite disposal of the tanks including appropriate offsite disposal of the asbestos walled tank. In addition, treatability studies will be conducted on the site soil to determine the effectiveness of several emerging treatment technologies. The estimated present worth cost for this remedial action is $11,660,000, which includes a total cost of $500,000 for removal of the steel tanks. A present worth O&M cost of $6,960,000 is included in the total present worth estimate.

PERFORMANCE STANDARDS OR GOALS: Ground water treatment will meet Federal and State SDWA MCLs and State Action Levels (SALs). Chemical-specific cleanup goals for ground water include benzene 1 ug/l (SAL) and TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Institutional methods to control well construction and pumping will be implemented to maintain ground water levels at the desired configuration.

KEYWORDS: Air Stripping; Alternate Water Supply; Asbestos; Benzene; Carbon Adsorption (GAC); Clean Air Act; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; Organics; Offsite Discharge; Offsite Disposal; Onsite Treatment; PAHs; PCBs; Pesticides; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Sole-Source Aquifer; Solidification/Stabilization; Sludge; State Standards/Regulations; Toluene; TCE; Treatability Studies; Treatment Technology; VOCs; Xylenes.

RAYTHEON, CA

First Remedial Action - Final
June 9, 1989

The Raytheon site is one of three Superfund sites that are being remediated concurrently. The other two are Fairchild Semiconductor (Mt. View) and Intel (Mountain View Plant). The sites are located in the Middlefield/Ellis/Whisman (MEW) Study Area in Santa Clara County in the city of Mountain View, California. Land use in the area is primarily light industrial and commercial, with some residential areas. There are no natural surface drainage features within or surrounding the site; most of the runoff is intercepted by a storm drain system and discharged to an offsite creek. Various industrial activties were conducted in the vicinity of the site including semiconductor manufacturing, metal finishing operations, parts cleaning, aircraft maintenance, and other activities requiring the use, storage, and handling of a variety of chemicals, particularly solvents. Site investigations at several of these facilities during 1981 and 1982 revealed significant contamination by toxic chemicals, primarily VOCs, in soil and ground water. The primary causes of the contamination were leaking storage tanks and lines, and poor management practices. Before and during additional site investigations, which were conducted under a 1985 Consent Order, interim cleanup activities were conducted at the site by Fairchild, Intel, and Raytheon. Cleanup actions included tank removals, soil removal and treatment, well sealing, construction of slurry walls, and hydraulic control and treatment of local ground water. The primary contaminants of concern affecting the site are VOCs including PCE, TCE, TCA, toluene, and xylenes; and other organics including phenols.

The selected remedy for this site includes in-situ vapor extraction with treatment by vapor phase GAC of contaminated soil found within the Fairchild and Raytheon slurry walls. There may be some limited soil excavation and treatment by aeration for some areas outside of the slurry walls, with onsite disposal of residues in the excavated area; ground water pumping and treatment using air stripping, and in some cases liquid phase GAC, with emissions controls consisting of GAC vapor phase carbon units, followed by reuse of the ground water (reuse options including reinjection are being developed) and, if necessary, discharge to surface water; sealing of any conduits or potential conduits to protect the deep aquifer; and ground water monitoring. The present worth cost for this remedial action is $49,000,000 to $56,000,000, which includes O&M costs.

PERFORMANCE STANDARDS OR GOALS: The cleanup goals for soil are based on ensuring the success of the ground water cleanup goal (attaining MCLs) in the shallow aquifers. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. Ground water cleanup goals for the shallow aquifers, which are not currently used for drinking water, are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL). Goals for the deep aquifers, which are used for drinking water, are based on a 10^{-6} cumulative cancer risk and include TCE 0.8 ug/l. Attainment of these levels will also ensure cleanup of other VOCs to at least their respective MCLs.

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Byron Barrel & Drum, NY Former Salvage Yard 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including chromium and lead	4,100 yd^3 (soil)	GW pumping and treatment using precipitation, sedimentation, and filtration to remove inorganics and air stripping and carbon adsorption to remove organics, followed by reinjection into aquifer and, if necessary, offsite discharge of excess treated water; offsite disposal of GW residues; in-situ soil flushing; dismantling and decontaminating debris, followed by offsite disposal; and air and GW monitoring	GW will meet State and Federal ARARs. Specific GW cleanup levels include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), xylenes 440 ug/l (MCL), PCE 5 ug/l (based on TCE MCL), and TCE 5 ug/l (MCL). Soil will meet site-specific action levels including toluene 45,000 ug/kg, xylenes 8,200 ug/kg, PCE 140 ug/kg, and TCE 47 ug/kg	$5,572,000 (present worth) $259,700 (annual O&M)
II	Caldwell Trucking, NJ Former Septic Waste Disposal Area 09/28/89 2nd	GW contaminated with VOCs including TCE	Not specified	GW pumping and treatment using airstripping with offsite discharge to SW; installation of a drainage system; sealing GW wells; and GW monitoring	ARAR waiver invoked based on technical impracticability. Remedy will achieve interim cleanup levels which will allow for potable use of GW	$11,540,000 (present worth) $315,000 (annual O&M years 1-30)
II	Chemical Insecticide, NJ Pesticide Production Facility 09/29/89 1st	Soil and SW contaminated with organics including pesticides and metals including arsenic	Not specified	Clearing, grading and capping site; constructing a SW run-off diversion system; controlling the release of uncontaminated SW run-off; and SW monitoring	SW discharge standards provided for arsenic 50 ug/l and for five pesticides based on State standards	$1,420,211 (present worth) $37,184 (annual O&M)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Monitoring; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Criteria; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Phenols; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Volatilization/Soil Aeration; Xylenes.

SACRAMENTO ARMY DEPOT, CA

First Remedial Action
September 29, 1989

The 485-acre Sacramento Army Depot (SAAD) site, 7 miles southeast of downtown Sacramento, California, is surrounded by land zoned as commercial and light industrial property. SAAD is an electronic maintenance and repair depot consisting of storage, maintenance, and office facilities. Present operations include shelter repair, electro-optics equipment repair, metal plating, and treatment of metal plating wastes. From approximately 1947 to 1972 paint sludges, oil, grease wood, trash, solvents and other industrial wastes were burned and disposed of onsite in burn pits. SAAD has since removed most of the burned material from the burn pits. The burn pits were subsequently covered with soil and revegetated. Ground water samples, collected by SAAD from 1981 to 1984, indicated that several chemical compounds were present at levels above drinking water standards in two areas. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE. The selected remedial action for this interim remedy includes ground water pumping and treatment using ultraviolet light/chemical oxidation followed by discharge to the regional treatment plant and industrial reuse of the treated ground water. The estimated capital cost for the remedy is $1,764,000 with an estimated annual O&M cost of $264,000.

PERFORMANCE STANDARDS OR GOALS: The overall quality of the ground water will be restored to meet current drinking water standards for TCE 5 ug/l (MCL) and PCE 4 ug/l (State action level).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Direct Contact; Ground Water; Ground Water Treatment; Interim Remedy; MCLs; O&M; Offsite Discharge; Onsite Treatment; PCE; Safe Drinking Water Act; State Standards/ Regulations; TCE; VOCs.

SAN FERNANDO VALLEY (AREA 1), CA

Second Remedial Action
June 30, 1989

The San Fernando Valley Basin (SFVB) Area 1 site is one of four Superfund sites (including SFVB Areas 2, 3, and 4) being remediated as one large site. The SFVB lies within the approximately 328,500-acre Upper Los Angeles River area. This remedial action is for the Burbank Well Field operable unit of the SFVB Area 1 site, located within the city of Burbank, California, and addresses a portion of the overall ground water problem in the SFVB Areas 1, 2, 3, and 4 sites. The SFVB aquifers are an important source of drinking water for approximately 600,000 residents in nearby cities and are also used for commercial and industrial purposes. Contaminated ground water is difficult to replace in this area because water from the metropolitan water district, an alternate source of drinking water, may not always be available due to periodic drought conditions and State and Federal water rights issues. Contaminated ground water in the SFVB wells was first discovered in 1980. Results of a ground water monitoring program conducted from 1981 through 1987 revealed approximately 50 percent of the water supply wells in the eastern portion of the SFVB were contaminated with TCE and PCE at concentrations exceeding State and Federal drinking water standards. All of Burbank's production wells have been shut down due to this VOC contamination. In 1987 the primary contaminant TCE was found in concentrations exceeding State Action Levels (SALs) in 48 percent of the SFVB's 120 production wells, and PCE levels exceeded SALs in 18 percent of the SFVB wells. In 1987 EPA selected a remedy to address another operable unit in Area 1, specifically the threat of contaminated public water supply wells located in the city of North Hollywood. The selected remedy for the North Hollywood operable unit included the construction of an extraction and aeration facility to pump and treat contaminated ground water in the North Hollywood area. The facility has been operational since March 1989. The remedy selected for the Burbank operable unit will control the migration of contaminated ground water in the SFVB where additional downgradient public water supply wells are threatened by contamination and will aid in aquifer restoration in the immediate Burbank area. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE.

The selected remedial action for this site includes pumping and treatment of ground water contaminated with TCE exceeding 100 ug/l or PCE exceeding 5 ug/l using air or stream stripping, with vapor phase GAC adsorption units if air stripping is used, and discharge to the municipal water supply distribution system; and ground water monitoring. The estimated present worth cost for this remedial action is $69,000,000, which includes an estimated present worth O&M of $43,900,000 (for a 20-year period).

PERFORMANCE STANDARDS OR GOALS: The ground water will be treated to attain MCLs including TCE 5.0 ug/l, and State Action Levels (SALs) including PCE 4.0 ug/l for treatment plant effluent concentrations.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Public Exposure; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatment Technology; VOCs.

SOUTH BAY ASBESTOS AREA, CA

Second Remedial Action - Final
September 29, 1989

The South Bay Asbestos Area site is at the northern end of the Santa Clara Valley and at the southern end of the San Francisco Bay, in San Jose, California. The 550-acre site includes the community of Alviso in the city of San Jose and neighbors a national wildlife refuge, marshland, and wetlands which support several endangered and threatened species. The land surrounding Alviso has been artificially raised with soil and debris fill, some containing asbestos to offset the effects of subsidence. From 1953 to 1982 the site operated as an asbestos-cement pipe manufacturing plant with asbestos-contaminated waste being disposed of onsite in three landfills. In 1983 the State collected soil samples which revealed that asbestos was randomly distributed throughout Alviso, including the Alviso Rim levee. The State also determined that the Guadulupe River levee contained asbestos-contaminated waste debris and soil. Contaminated soil from the levee was removed and several emergency removal actions followed to reduce exposure to asbestos. To address the asbestos contamination at the site, EPA divided remedial activities into two RODs. The first ROD addressed contamination at the rim levee. This second and final ROD addresses the asbestos contamination found at the remainder of the site. The primary contaminant of concern affecting the soil, debris, and air is asbestos.

The selected remedial action for this site includes paving approximately 128,500 square yards of an asbestos-contaminated truck yard and industrial yard; controlling dust emissions through monthly wet sweeping of streets; offsite disposal of asbestos-contaminated debris; air monitoring; and implementation of deed restrictions and other institutional controls. The estimated present worth cost for this remedial action is $7,561,000 which includes annual O&M costs of $134,900 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Paving will be required for target areas with high potential for soil disturbance and for areas which are found to contain greater than one area percent asbestos by polarized light microscopy.

INSTITUTIONAL CONTROLS: Deed restrictions and other institutional controls will be implemented.

KEYWORDS: Air; Air Monitoring; Asbestos; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Direct Contact; Floodplain; Institutional Controls; O&M; Offsite Disposal; Soil; State Standards/Regulations; Toxic Substances Control Act; Wetlands.

RECORDS OF DECISION ABSTRACTS
REGION X
(Alaska, Idaho, Oregon, Washington)

COMMENCEMENT BAY NEAR SHORE/TIDE FLATS, WA
Second Remedial Action
September 30, 1989

The Commencement Bay Near Shore/Tide Flats site is in Tacoma, Pierce County, Washington at the southern end of the main basin of Puget Sound. The site encompasses an active commercial seaport and includes 10 to 12 square miles of shallow water, shoreline, waterways and adjacent land. Site contamination is the result of a long history of industrial activity in the area. More than 281 active industrial facilities are in the area and approximately 34 of those are NPDES permitted dischargers. Releases of hazardous substances to the marine environment have resulted in contamination of bottom sediment in the waterways of the Tideflats Industrial Area, and along the shoreline in the Nearshore Area. This ROD represents two of six operable units for the site and will address source control and marine sediment contamination in the Nearshore/Tideflats environment. Eight problem areas are being addressed independently by this remedy. The remaining operable units will address remedial responses to releases of hazardous substances associated with the Tacoma tar pits and the ASARCO Tacoma smelter. The primary contaminants of concern affecting the sediment are organics including PCBs and PAHs; and metals including arsenic, mercury, lead, and zinc.

The selected remedial action for this site includes an 8-year active cleanup phase for source control and sediment remediation, and a 10-year natural recovery phase. Source control remediation includes the identification and control of sources of contamination into the marine environment at the site. Sediment remediation includes a combination of natural recovery for areas expected to recover naturally within a 10-year period after source control measures are implemented, and the utilization, as appropriate, of four active sediment control alternatives to remediate approximately 1,181,000 cubic yards of contaminated sediment. The four sediment confinement options include in-situ capping, (placement of clean material on top of existing substrate), confined aquatic disposal (removal of contaminated sediments with confined disposal in shallow or open-water aquatic environments using capping with clean dredged material), confined nearshore disposal (removal and confined disposal in the nearshore environment with capping and diking), and removal and upland disposal (transferring dredged material to a land-based confinement facility). In addition, the remedy will implement site use restrictions, and source and sediment monitoring. The estimated total cost for sediment remediation at the site is $32,300,000, which includes O&M costs for 10 years. Costs associated with source control activities are not included in this ROD because of the difficulty in determining what proportion of total source-related cost can be attributed directly to achieving remedial objectives.

PERFORMANCE STANDARDS OR GOALS: Sediment quality objectives will be achieved within 10 years following source control in each problem area. Sediment cleanup levels were developed for each of the confinement technologies using the apparent effects threshold (AET) approach. An AET is the sediment concentration of a chemical above which statistically significant biological effects are always observed. A sediment cleanup level of 150 ug/kg was derived for PCBs to attain a fish tissue concentration objective of 36 ug/kg which translates to a 10^{-5} individual lifetime risk factor for fish consumption. Other specific sediment quality objectives include arsenic 57 mg/kg, lead 450 mg/kg, and PAHs 17,000 ug/kg.

INSTITUTIONAL CONTROLS: Site use restrictions will consist mainly of public warnings and educational programs intended to reduce potential exposure to site contamination, particularly ingestion of contaminated seafood.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Clean Water Act; Direct Contact;

Dredging; Excavation; Floodplain; Institutional Controls; Lead; Metals; Offsite Disposal; Onsite Containment; Onsite Disposal; O&M; PAHs; PCBs; RCRA; Safe Drinking Water Act; Sediment; State Permit; State Standards/ Regulations; Water Quality Criteria; Wetlands.

NORTHSIDE LANDFILL, WA

First Remedial Action - Final

September 30, 1989

The 345-acre Northside Landfill is in a mixed residential and agricultural area, in the northwest corner of the city of Spokane, Spokane County, Washington. The landfill has been used since the 1930s by the city of Spokane and a variety of private and public haulers for disposal of residential and light commercial refuse. The landfill is divided into four disposal units; refuse unit, a grease skimmings unit, an old open burn unit and a sewage sludge unit. Only the refuse unit is active. However, this unit is scheduled to close by 1992. The western one third of the landfill lies over the large Spokane Valley-Rathdrum Prairie Aquifer (SVRPA). The SVRPA was designated as a sole source of water supply for the Spokane-Coeur d'Alene area by EPA in 1978. Investigations conducted in 1981 and 1983 indicated the presence of VOCs beneath the site and in offsite residential wells located northwest of the landfill. The city immediately supplied the 19 affected residences with bottled water and has since extended municipal water lines to the area. The primary contaminants of concern affecting the ground water are VOCs including PCE, TCA, and TCE. In addition, iron and lead exceed the secondary drinking water standards offsite.

The selected remedial action for this site includes immediate closure of the inactive units of the landfill with final closure of the active portion by 1992; capping all disposal units; constructing an interim pumping and treatment facility for ground water remediation until landfill closure effectively reduces contaminants to below the MCLs, followed by offsite discharge of treated water into the Spokane River; ground water monitoring; providing an alternate supply of drinking water to residences affected by the contaminated ground water; implementing institutional controls to restrict site access, protect the landfill cap, and prevent construction of domestic wells in the contaminated plume; and controlling landfill gas emissions. The estimated present worth cost of this remedy is $30,000,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy is expected to control the migration of ground water contaminants offsite and meet MCLs or AWQC, whichever is applicable. Chemical-specific ARARs for ground water include TCA 200 ug/l (MCL) and TCE 5 ug/l (MCL). The performance criteria for PCE is stated as 5 ug/l.

INSTITUTIONAL CONTROLS: Institutional controls will address the installation of new wells within the contaminated plume and restrict site access.

KEYWORDS: Alternate Water Supply; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; MCLs; Metals; Offsite Discharge; O&M; Onsite Containment; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Sole-Source Aquifer; Solvents; State Standards/Regulations; TCE; VOCs; Water Quality Criteria.

NORTHWEST TRANSFORMER, WA

First Remedial Action - Final

September 15, 1989

The Northwest Transformer site (NWT), a 1.6-acre former salvage yard, is approximately 2 miles south of Everson in Whatcom County, Washington. The site is in a rural area and is bordered by low-density residential areas to the north and east, and farmland to the south. The NWT site was used for transformer storage and salvage. Storage and salvage operations were conducted in an onsite barn where PCB-contaminated dielectric fluid was drained from the transformers before dismantling. Transformer casings and associated parts were incinerated onsite, and some of the recovered oil was burned to heat the barn. Spillage and leakage of PCB-laden oil on the ground appeared to have occurred frequently, and some oil apparently was dumped directly into a seepage pit onsite, contaminating soil and possibly ground water. EPA performed several soil and ground water sampling studies between 1977 and 1985 and identified PCB concentrations as high as 38,000 mg/kg. In 1985 EPA performed an Immediate Removal Action to address the danger posed by PCB contamination, including removing 1,400 cubic yards of PCB-contaminated soil and debris, 6,660 gallons of PCB-contaminated liquids, several contaminated transformer casings, monitoring ground water, and imposing site access restrictions. In 1987 sampling during an RI/FS identified sufficient PCB contamination in the soil to warrant further site remediation. This operable unit includes investigations of ground water and the onsite barn to determine whether either is sufficiently contaminated to merit a subsequent operable unit. The primary contaminant of concern affecting the soil is PCB.

The selected remedial action for this site includes excavation, consolidation, and treatment of approximately 1,200 cubic yards of soil with a PCB concentration greater than 10 mg/kg using in-situ vitrification; placement of two feet of clean fill over the entire site; abandonment of an onsite well; and ground water monitoring and sampling of the wood in the onsite barn to determine if a second operable is necessary to address PCB-contamination in these media. The estimated present worth cost for this remedial action is $771,000 for soil treatment only with no O&M required.

PERFORMANCE STANDARDS OR GOALS: The contaminated soil will be treated until the concentration of PCBs in the remaining residue is less than 1 mg/kg. This concentration is below the TSCA-required treatment concentration of 2 mg/kg PCBs in contaminated materials.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Direct Contact; Excavation; Filling; Ground Water Monitoring; Onsite Disposal; Onsite Treatment; PCBs; Soil; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology; Treatability Studies; Vitrification.

SECTION III

RECORDS OF DECISION SUMMARY TABLE

FY 1989

The FY 1989 Record of Decision (ROD) Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed during FY 1989. The table is presented by Region, in alphabetical order according to the site name.

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Auburn Road Landfill, NH 14-Acre Landfill Area 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including benzene, toluene, TCE, and PCE; and metals including arsenic and lead	Not specified	Downgradient GW pumping and treatment using chemical coagulation and precipitation to remove metal contaminants and air stripping to remove VOCs, which will be collected in a vapor phase carbon adsorption system, followed by onsite discharge to recharge trenches; GW monitoring; and capping	Target GW cleanup goals are based on SDWA MCLs or PMCLs and include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), PCE 5 ug/l (PMCL), TCE 5 ug/l (MCL), arsenic 50 ug/l (MCL), and lead 50 ug/l (MCL)	$24,100,000 (present worth) $1,460,000 (annual present worth O&M)
I	Baird & McGuire, MA Former Chemical Manufacturing Facility 09/14/89 3rd	Sediment contaminated with organics including PAHs and pesticides; and metals including arsenic	1,500 yd^3 (sediment)	Sediment excavation and onsite incineration; backfilling excavated areas with clean fill and onsite placement of treated sediment; long-term SW and sediment monitoring; wetland restoration; and placement of silt curtains downstream of site	Cleanup goals for sediment are based on a 10^{-5} to 10^{-6} excess cancer risk. Chemical-specific goals include DDT 19 mg/kg, arsenic 250 mg/kg, chlorodane 5 mg/kg, and PAHs 22 mg/kg	$1,656,000 (present worth) $22,000 (annual O&M)
I	Kellogg-Deering Well Field, CT 10-Acre Municipal Well Field 09/29/89 2nd	Soil and GW contaminated with VOCs including benzene, toluene, PCE, TCE, and xylenes	44,000 yd^3 (soil)	Onsite in-situ vacuum extraction of soil followed by carbon adsorption; GW pumping and treatment using air stripping followed by offsite discharge; periodic GW, soil vapor, and indoor air sampling; and implementation of soil excavation and well installation restrictions	Chemical-specific cleanup goals for GW are based on SDWA MCLs or PMCLs and include benzene 0.005 mg/l, toluene 2 mg/l, TCE 0.005 mg/l, and PCE 0.005 mg/l. Chemical-specific cleanup goals for soil are based on a soil leachability model, vary depending on soil type, and include benzene 0.0012-.0367 mg/kg, toluene 5.5-169 mg/kg, TCE 0.012-0.358 mg/kg, and PCE 0.033-1.036 mg/kg	$9,100,000 (present worth) $3,034,000 (present worth O&M years 1-30)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Norwood PCBs, MA Former Electrical Equipment Disposal Area 09/29/89 1st - Final	Soil, sediment, debris, and GW contaminated with VOCs including PCE and TCE; other organics including PAHs, PCBs and phenols; and metals	31,000 yd^3 (soil) 3,000 yd^3 (sediment)	Excavation, solvent extraction and onsite disposal of soil and sediment followed by installation of soil cover over treated soil; offsite incineration and disposal of extracted PCB-contaminated oils; flushing and cleansing portions of drainage system; cleaning and sealing roof surfaces, and decontaminating debris which exceed TSCA cleanup levels; GW collection in a barrier drain trench with onsite treatment by carbon adsorption, air stripping and precipitation/filtration; wetlands restoration; GW, soil, sediment and debris monitoring; and implementation of institutional controls to restrict GW use and to prevent soil and sediment disturbance	EPA divided the site into 3 sections and established cleanup levels for each section. Chemical-specific soil target cleanup levels range depending on location of soil, and include PCBs 1-10 mg/kg (based on a cancer-risk level no greater than 7 x 10^{-6}), PAHs 2-6 mg/kg (based on a cancer-risk level no greater than 7 x 10^{-6}). TCE 24 ug/kg and PCE 60 ug/kg (both based on preventing contamination to GW above MCLs). Sediment cleanup levels include PCBs 1 mg/kg (based on 1.5 x 10^{-7} excess cancer-risk level) and PCBs 0.5 ug/kg for discharge to SW. GW cleanup goals are based on Federal and State MCLs and include TCE 5 ug/l and PCE 5 ug/l	$16,100,000 (present worth; includes O&M years 1-10)
I	O'Connor, ME 9-Acre Transformer Recycling Facility 09/27/89 1st - Final	Soil, sediment, GW and SW contaminated with VOCs including benzene; other organics including PCBs and PAHs; and metals including lead	23,500 yd^3 (soil and sediment)	Pumping and offsite treatment of lagoon and upland marsh SW; excavation and onsite solvent extraction of soil and sediment, followed by onsite disposal of residuals; onsite treatment of gases from solvent extraction process; extraction and offsite incineration of solvent residues; onsite solidification of soil and sediment that do not achieve target cleanup levels, followed by offsite disposal; backfilling and upgrading excavated areas; GW pumping and treatment using activated carbon adsorption followed by onsite reinjection; sediment and GW monitoring; and implementation of deed and land use restriction to prohibit GW use	Target cleanup goals are based on a 10^{-5} excess cancer risk. Individual goals for soil and sediment include PCBs 1 mg/kg, PAHs 1 mg/kg, and lead 248 mg/kg; for GW: PCBs 0.5 ug/l and benzene 5 ug/l; for SW: PCBs 0.065 ug/l and lead 1.94 ug/l	$14,221,000 (total cost) $56,000 (O&M year 1) $54,000 (O&M years 2-4) $92,000 (O&M year 5) $65,000 (O&M years 6-30)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Pinette's Salvage Yard, ME PCB Spill Area 05/30/89 1st - Final	Soil and GW contaminated with VOCs including benzene; other organics including PCBs; and metals including lead	2,200 yd^3 (soil)	Excavation and offsite incineration of soil with PCB concentrations >50 mg/kg; excavation and onsite solvent extraction of soil with PCB concentrations between 5-50 mg/kg with offsite incineration of treatment process effluent and onsite treatment of air emissions; excavation and onsite disposal of surface soil with PCB concentrations between 1-5 mg/kg, followed by additional soil covering and revegetation; GW pumping and treatment using filtration and carbon adsorption, followed by discharge into aquifer; sediment, GW, and SW monitoring; and implementation of access restrictions and institutional controls	Target soil cleanup goals include PCBs 5 mg/kg (State) and benzene 260 ug/kg. Target GW cleanup goals include PCBs 0.5 ug/l (State), benzene 5 ug/l (MCL), and lead 5 ug/l (MCL). EPA is in- voking a waiver from the PCB target cleanup goal due to technical impracticability	$4,367,000 (present worth) $135,000 (annual O&M years 1-2) $42,000 (annual O&M years 3-5) $20,000 (annual O&M years 6-30)
I	Saco Tannery Waste Pits, ME Process Waste Disposal Area 09/27/89 1st - Final	Sediment, sludge, GW, and SW contaminated with metals including arsenic, chromium, and lead	Not specified	The selected remedial action is contingent upon the State designating the site a permanent conservation area and includes pumping, offsite treatment and discharge of water from waste pits and lagoons followed by covering and revegetating waste pits, lagoons, and wet areas; compensating for lost wetlands; GW and SW monitoring; implementating institutional controls; and implementing a contingency plan, if legislation is not passed which includes excavating and solidifying soil and sludge with onsite disposal in a RCRA-permitted landfill; and GW and SW monitoring	Target cleanup goals were developed for sediment and sludge contaminants which exceed a carcinogenic risk of 10^{-7} or a noncarcinogenic risk greater than an HI of 1.0. Specific goals include total chromium 2,000 mg/kg (based on ecological risk assessment), lead 125 mg/kg (State), and arsenic 60 mg/kg. If GW contaminants exceed ACLs, further site evaluation will be necessary	$9,211,600 - $10,551,400 (present worth) $2,500,000 - $3,800,000 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	South Municipal Water Supply Well, NH Manufacturing Facility 09/27/89 1st - Final	Soil, sediment, and GW contaminated with VOCs including PCE, TCE and toluene; other organics including PCBs and PAHs; and metals	7,500 yd^3 (soil) 1,170 yd^3 (sediment)	GW pumping and treatment using a phase separation settlement tank/pretreatment system, air stripping, carbon columns for air emission control, and onsite discharge; GW pumping from dilute plume and treatment using air stripping and carbon columns and onsite discharge; in-situ vacuum extraction of soil; excavation and/or dredging with dewatering of wetlands sediment and offsite disposal; wetlands restoration; surface contouring and revegetation; long-term GW monitoring; and implementation of institutional controls including GW use and well installation restrictions	Target cleanup levels for GW are based on SWDA MCLs or PMCLs and include PCE 5 ug/l, TCE 5 ug/l, and toluene 2,000 ug/l. Target cleanup levels for soil were established to reduce contaminant migration to GW and include PCE 4.5 ug/kg, TCE 1.5 ug/kg, and toluene 1,500 ug/kg. Soil target levels will attain 3 x 10^{-10} excess cancer-risk level. Target cleanup levels for sediment include PAHs 1.1 ug/kg and PCBs 1 ug/kg, which will attain an excess cancer risk of 2.9 x 10^{-7} for PCBs and 1.3 x 10^{-6} for PAHs for a total risk of 1.3 x 10^{-6}	$7,387,769 (present worth) $3,992,105 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Sullivan's Ledge, MA 12-Acre Waste Disposal Area 06/29/89 1st	Soil, sediment, GW, and SW contaminated with VOCs, including benzene and TCE; other organics including PCBs and PAHs; and metals including lead	24,200 yd^3 (soil) 1,900 yd^3 (sediment)	Excavation/dredging of soil/sediment with onsite solidification, followed by onsite disposal and capping; air monitoring; diversion and lining of the stream adjacent to site; GW pumping and passive underdrain collection and treatment using oxidation/filtration and UV/ozonation with offsite disposal of contaminated residues; wetlands restoration/enhancement;sediment, GW, and SW monitoring; and implementation of GW use and land access restrictions	Onsite soil cleanup standards for PCBs and PAHs are health based using a 10^{-5} cancer-risk level and include remediation of soil contaminated with total PCBs >50 mg/kg and/or total cPAHs >30 mg/kg. Offsite soil with PCBs >10 mg/kg (based on a 10^{-5} cancer-risk level) will be excavated and disposed of onsite, and soil with PCBs >50 mg/kg will be solidified onsite. Sediment cleanup standard for PCBs is the interim sediment quality criteria value of PCBs 20 ug/gC. Where TOC <10 gC/kg, target treatment for sediment will be PCB 0.2 mg/kg. GW standards include VOCs 1-10 mg/l and/or until there is no significant contaminant reduction	$10,100,000 (present worth)
I	W.R. Grace, MA (Acton Plant) 200-Acre Waste Disposal Area 09/29/89 1st	Sediment, soil, and sludge contaminated with VOCs including benzene and toluene; other organics; and metals including arsenic	Not specified	Excavating and incinerating offsite highly contaminated soil and sludge; solidifying onsite less contaminated soil, sludge, and sediment, followed by onsite disposal in the landfill and capping the landfill; covering and monitoring other waste areas; modifying the aquifer restoration system; and environmental monitoring	Soil cleanup goals will ensure that any further contaminant migration to GW will not result in GW levels exceeding drinking water standards. Chemical-specific goals were provided but specific goals for each contaminant varied depending on the location of the waste area onsite. The overall cumulative risk associated with the soil cleanup level is 8.34×10^{-7}	$7,058,000 (total cost) $2,468,000 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Wells G&H, MA Municipal Well Field 09/14/89 1st	Soil, sludge, debris, and GW contaminated with VOCs including TCE and PCE; other organics including cPAHs, PCBs, and pesticides; and metals including lead	10,500 yd^3 (soil) 410 yd^3 (sludge and debris)	In-situ volatilization using carbon adsorption for treatment of the extracted vapor of VOC-contaminated soil; excavation and onsite incineration of the remaining contaminated soil and backfilling of the excavated areas; GW pumping and treatment using pretreatment for metals, followed by air stripping and vapor phase carbon filtering with either onsite discharge or reinjection, or both; removing and disposing sludge and debris; GW monitoring; and implementation of deed and land use restrictions	GW cleanup goals include TCE 5.0 ug/l (MCL) and PCE 5.0 ug/l (PMCL). Soil cleanup goals and include PCE 36.7 ug/kg and TCE 12.7 ug/kg (based on protecting GW from VOC contamination from the soil); cPAHs 0.694 mg/kg, PCB 1.04 mg/kg, and 4-4' DDT 23.5 mg/kg (based on a 10^{-6} cancer-risk level); and lead 640 mg/kg (based on target blood level of 10 ug/dl)	$68,400,000 (present worth) $0 (O&M)
II	BEC Trucking, NY Former Truck Maintenance Facility 09/28/89 1st - Final	None	Not applicable	No further action with GW and SW monitoring	Not applicable	$0 (capital) O&M to be determined
II	Bog Creek Farm, NJ Waste Disposal Site 06/28/89 2nd - Final	Sediment and GW contaminated with VOCs including benzene, toluene, and xylenes; other organics including phenols; and metals including lead	90 yd^3 (sediment)	GW pumping and treatment using air stripping, H_2O_2-UV photolysis oxidation, and carbon adsorption and reinjection; brook sediment excavation followed by onsite incineration and onsite disposal; and streambed restoration	GW cleanup goals are derived from discharge limits allowed under a State permit. Specific goals include benzene, 5 ug/l; toluene 74 ug/l; phenols 47 ug/l; and lead 56 ug/l	$6,927,000 (present worth) $663,000 (annual O&M years 1-10)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Ciba-Geigy, NJ Industrial Facility 04/24/89 1st	GW contaminated with VOCs including benzene, PCE, TCE, and toluene; and metals including arsenic and chromium	Not specified	Sealing contaminated residential irrigation wells; on- and offsite GW pumping with onsite treatment using filtration, reverse osmosis, and GAC followed by temporarily retaining GW in monitoring basins and subsequent discharge to SW; and implementation of a river and GW monitoring program	Treated GW will meet the proposed State Surface Water Quality Standards including benzene 1 ug/l, PCE 1 ug/l, TCE 1 ug/l, toluene 26 ug/l, total chromium 50 ug/l, and arsenic 50 ug/l. State MCLs will be attained for the aquifer including benzene 1 mg/l, PCE 1 mg/l, TCE 8 mg/l, aresenic 0.05 ug/l, and chromium 0.05 mg/l. For unregulated VOCs in the aquifer, single contaminant levels for carcinogens are not to exceed 5 ug/l and 50 ug/l for possible carcinogens or non-carcinogens	$164,500,000 (present worth) $12,539,000 (annual O&M)
II	Claremont Polychemical, NY Industrial Facility 09/22/89 2nd - Final	Sludge and debris contaminated with VOCs including benzene, toluene, TCE, and PCE; other organics; and metals including arsenic, chromium, and lead	100,000 lbs (solids) 25,000 lbs (sludge) 10,000 lbs (liquids)	Compatibility testing and consolidation of compatible wastes and pumping contents of tanks, basins and sump into storage tanks; analytical testing of samples to determine appropriate treatment or disposal methods; and transporting wastes for offsite treatment or disposal, as appropriate	RCRA wastes will be treated to BDAT or treated to attain specific treatment levels, as appropriate, to comply with RCRA LDRs. Chemical-specific goals were not specified	$1,339,000 (present worth) $0 (O&M)
II	Clothier Disposal, NY 6-Acre Non-Permitted Disposal Area 12/28/88 1st - Final	Soil contaminated with VOCs including toluene, xylenes, and PCE; other organics including PAHs, PCBs, and phenols; and metals	Not specified	Placing a soil cover over the contaminated areas, regrading, and revegetating site; installing rip-rap, as needed; construction and post-construction air monitoring; long-term soil, sediment, GW, and SW monitoring; and implementing land use and GW use restrictions	Because the remedy addresses containment, chemical-specific goals are not applicable	$500,000 (present worth) $27,000 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	De Rewal Chemical, NJ Former Dumping Area 09/29/89 1st	Soil and GW contaminated with VOCs including PCE, TCE and toluene; other organics including PAHs; and metals including chromium and lead	8,000 yd^3 (soil)	Excavation and onsite thermal treatment of organic-contaminated soil and solidification of inorganic-contaminated soil and ash residues followed by onsite disposal monitoring and controlling air emissions generated during thermal treatment; GW pumping and offsite treatment at an industrial wastewater treatment facility; GW monitoring; provision of a treatment system for onsite residential well; temporary relocation of onsite residents; preparation of cultural resources survey; and implementation of land use restrictions	Contaminated soil which exceeds State action levels will be excavated and treated to meet State action levels which include VOCs 1 mg/kg, chromium 100 mg/kg, and lead 250 mg/kg. GW will also be treated to meet State SDWA MCLs which include TCE 1 ug/l, PCE 1 ug/l, chromium 50 ug/l, and lead 50 ug/l	$5,097,000 (present worth) $865,400 (O&M)
II	Ewan Property, NJ 43-Acre Industrial Waste Disposal Area 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including benzene, TCE, PCE, toluene, and xylenes; and metals including chromium and lead	22,000 yd^3 (soil)	Excavating and treating soil using solvent extraction and soil washing, followed by redepositing treated soil onsite as clean fill; treating and disposing of spent solvent offsite; treating spent wash water onsite using GW treatment system; regrading and revegetating disposal areas; GW pumping and treatment, followed by reinjection into aquifer; and environmental monitoring	Treated soil will meet State Solid Waste Regulations. Treated GW will meet State water quality criteria (SWQC) and MCLs. Specific GW treatment levels include benzene 1 ug/l (SWQC), TCE 26 ug/l (SWQC), toluene 2,000 ug/l (PMCL), xylenes 44 ug/l (SWQC), lead 50 ug/l (MCL), and chromium 50 ug/l (SWQC)	$35,152,447 (present worth) $1,983,980 (annual O&M)
II	FAA Technical Center, NJ Federal Facility 09/26/89 1st	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes; and other organics including PAHs and phenols	33,000 yd^3 (soil) 360,000 gals (free product) 13,300,000 gals (GW)	In-situ soil vacuum extraction (soil venting) and off-gas treatement using either incineration or activated carbon adsorption; extraction of the free product floating on the plume followed by offsite incineration; GW extraction and addition of nutrients for subsequent reinjection and in-situ biodegradation of residual GW contamination; and GW monitoring	GW cleanup goals are based on Federal and State MCLs and include benzene 1 ug/l (MCL), xylenes (total) 44 ug/l (State MCL), toluene 2,000 ug/l (Federal PMCL), and phenols 300 ug/l (State GWQS). Soil cleanup levels are based on State Soil cleanup action levels and include 1 mg/kg for total priority pollutant VOCs and 100 mg/kg for total petroleum hydrocarbons	$583,000 (present worth) $200,000 (total present worth O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Fulton Terminals, NY Hazardous Waste Staging and Storage Area 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene, TCE and xylenes; other organics including PAHs; and metals including arsenic	4,000 yd^3 (soil)	Excavation and low temperature thermal treatment of soil followed by backfilling; capping site with clean top soil; GW pumping and treatment using air stripping and carbon adsorption followed by reinjection or other type of recharge into the aquifer; disposal of soil and GW treatment residues waste at a RCRA-approved facility; air and GW monitoring; and implementation of institutional controls including GW use restrictions	Soil treatment levels are designed to prevent leaching to GW that will result in levels above MCLs. Chemical-specific soil goals include TCE 2 mg/kg, benzene 1.4 mg/kg, and xylenes 8 mg/kg. GW cleanup goals will meet the more stringent of Federal or State drinking water standards including TCE 5 ug/l (MCL) and arsenic 1,000 ug/l (MCL)	$4,031,000 (present worth) $732,000 (annual O&M years 1-3)
II	Glen Ridge Radium Site, NJ Former Radium Processing or Utilization Area 06/30/89 1st	Soil and structures contaminated with radium ^{226}	41,000 yd^3 (soil)	Excavation and offsite disposal of soil and debris; installation and maintenance of indoor engineering controls; environmental monitoring; and continuation of treatment technology study	Surface soil (top 6") will be removed until concentration is 5 pCi/g above background and subsurface soil is 15 pCi/g above background	$53,000,000 (present worth) $0 (O&M)
II	Marathon Battery, NY Former Battery Manufacturing Facility 09/29/89 3rd - Final	Sediment contaminated with metals including cadmium and nickel	55,000 yd^3 (sediment)	Dredging cadmium-contaminated sediment followed by onsite chemical fixation and offsite disposal; sediment sampling with dredging and onsite treatment; and sediment monitoring	Acceptable sediment concentration of cadmium is 220 mg/kg. Expectations are that by dredging the upper layer of contaminated sediment, 95% of the cadmium contamination will be removed. Following remediation, cadmium concentrations are not expected to exceed 10 mg/kg	$48,499,500 (present worth) $21,303,330 (O&M year 1) $132,700 (O&M years 2-30)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Montclair/ West Orange Radium Site, NJ Former Radium Processing or Utilization Area 06/30/89 1st	Soil and structures contaminated with radium ^{226}	41,000 yd^3 (soil)	Excavation and offsite disposal of soil and debris; installation and maintenance of indoor engineering controls; environmental monitoring; and continuation of treatment technology study	Surface soil (top 6") will be removed until concentration is 5 pCi/g above background and subsurface soil is 15 pCi/g above background	$53,000,000 (present worth) $0 (O&M)
II	North Sea Municipal Landfill, NY 131-Acre Municipal Landfill 09/29/89 1st	Soil and sludge contaminated with VOCs; other organics including PAHs; metals including arsenic and lead; and other inorganics	Not specified	Capping landfill cell #1; implementing site security and deed restrictions; sampling sludge/soil in former sludge lagoons; and long-term air, SW, and GW quality monitoring	Capping the landfill reduces emissions of methane and VOCs, and reduces precipitation percolation through the landfill and thus migration of hazardous substances into GW. Individual contaminant goals were not specified	$7,700,000 - $8,300,000 (present worth) $190,000 - $200,000 (annual O&M)
II	Pepe Field, NJ Processing Wastes Disposal Area 09/29/89 1st - Final	Soil found in landfill contaminated with hydrogen sulfide and methane gases	Not specified	Installing and maintaining landfill gas collection and treatment system using of carbon adsorption; disposing carbon offsite; upgrading and maintaining existing leachate collection and treatment system; GW monitoring; and implementing deed restrictions	GW and soil already meet State drinking water standards and State action levels. Leachate quality will comply with State requirements. Emissions from gas treatment system will comply with State air pollution regulations. Chemical-specific cleanup goals were not specified	$1,293,700 (present worth) $108,000 (O&M years 1-2) $93,000 (O&M years 3-30)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Picatinny Arsenal, NJ Federal Facility Weapons and Munitions Research and Development Installation 09/28/89 1st	GW contaminated with VOCs including TCE and metals	Not specified	GW pumping and treatment using pretreatment for metals and solids removal and air stripping for VOCs removal; discharge of treated GW to SW; and air and effluent monitoring	ARARs for GW cleanup will apply to final remedial action, not to this interim action	$2,100,000 (capital) $1,100,000 (annual O&M)
II	Port Washington Landfill, NY 53-Acre Inactive Landfill 09/30/89 1st - Final	Soil and GW contaminated with VOCs including PCE, TCE, and benzene; and other organics including methane gas	Not specified	Capping landfill; rehabilitating existing gas collection system and installing additional vacuum extraction vents; GW pumping and treatment using air stripping followed by discharge to an aquifer recharge basin; and environmental monitoring	GW cleanup goals are based on SDWA MCLs and State standards for drinking water. Chemical-specific goals were not specified	$42,580,000 (present worth) $16,247,000 (present worth O&M years 1-30)
II	Preferred Plating, NY Plating Facility 09/22/89 1st	GW contaminated with VOCs including TCE and PCE; and metals including chromium and lead	Not specified	GW pumping and treatment using precipitation, carbon adsorption, and ion exchange followed by GW reinjection, and offsite disposal of treatment residues	GW cleanup goals are based on SDWA MCLs and State water quality regulations and will be attained provided upgradient source areas are removed	$9,327,400 (present worth) $920,900 (annual O&M years 1-12)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	SMS Instruments (Deer Park), NY Active Industrial Facility 09/29/89 1st	Soil and GW contaminated with VOCs including PCE, TCE, and xylenes; and metals including chromium and lead	1,250 yd^3 (soil)	In-situ steam stripping of soil, and GW pumping and treatment using air stripping followed by reinjection. A contingency plan may be implemented if in-situ steam stripping cannot be utilized effectively; contingency plan includes offsite incineration of contaminated soil	Treated GW will meet State and Federal drinking water standards prior to reinjection. Specific GW cleanup goals include TCE 5 ug/l (MCL), PCE 0.7 ug/l (State), xylenes 5 ug/l (State), chromium 50 ug/l (MCL), and lead 25 ug/l (State). Soil will be treated until all contaminants of concern attain a level less than 10 ug/kg	$1,195,800 (present worth) $437,576 (annual present worth O&M)
II	Vineland Chemical, NJ Disposal Area 09/28/89 1st	Soil, sediment, and GW contaminated with metals including arsenic	126,000 yd^3 (soil) 62,600 yd^3 (sediment)	Site remediation has been divided into 4 OUs. OU 1 includes in-situ flushing of soil with onsite treatment along with GW from OU 2; decontaminating onsite storage buildings; and closing two impondments after offsite treatment and disposal of recovered wastewater and sludge. OU 2 includes GW pumping and onsite treatment followed either by reinjection, offsite discharge to SW, or reuse for soil flushing. OU 3 includes excavating, dredging, and treating sediment using water wash extraction followed by onsite redeposition of treated sediment, and implementing natural river flushing. OU 4 is an interim remedy for lake sediment and includes dredging, excavating, and treating sediment using water wash extraction followed by redeposition and sediment and SW monitoring; treating and disposing of sludge residue offsite will follow all treatments	Soil, sediment, and GW cleanup goals for arsenic are based on 10^{-6} health-based levels and MCLs. Specific goals include 20 mg/kg (soil and surface sediment), 120 mg/kg (submerged sediment), and 50 ug/l (GW)	$66,384,636 (present worth) $3,463,463 (short-term source control O&M) $38,010 (long-term source control O&M) $5,155,053 (GW O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Vineland State School, NJ 195-Acre Residential Treatment Facility 09/30/89 1st - Final	None	Not applicable	Investigation results indicated very low levels of contamination. Because risks fall within the acceptable range, as determined by the State and EPA, no further remedial action is considered necessary	Not applicable	Not specified
III	Ambler Asbestos Piles, PA 3.5-Acre Asbestos Pile 09/29/89 2nd - Final	Soil, sediment, debris, and SW contaminated with asbestos	110,000 yd^3 (debris)	Regrading waste pile and placing a soil cover over portions of the site; performing a verification study to determine the source of inorganics in SW; installing and implementing erosion and sedimentation controls; SW and air monitoring; and implementing institutional controls including land use restrictions	Remedy addresses containment of asbestos-contaminated debris; therefore, no cleanup level is provided for the debris	$753,000 (present worth) $21,700 (O&M years 1-5) $10,200 (O&M years 6-30)
III	Bally Ground Water Contamination, PA Municipal Well Field 06/30/89 1st	GW contaminated with VOCs including TCE	Not specified	Abandoning appropriate wells; GW pumping and treatment by air stripping with either vapor phase carbon, regenerable vapor phase carbon, or vapor phase catalytic oxidation, followed by discharging treated water to an adjacent stream or municipal potable water system; GW and SW monitoring; and implementing institutional controls restricting GW use and the construction of new wells	GW will be treated to meet MCLs or PMCLs when final MCLs are unavailable. Chemical-specific goals include TCE 0.005 mg/l (MCL)	$2,950,000 - $3,640,000 (present worth) $105,000 - $189,000 (O&M)
III	Craig Farm Drum, PA Industrial Landfill 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene; other organics including phenols; metals including chromium and lead; and other inorganics	32,000 yd^3 (soil)	Excavating soil with onsite treatment using solidification; placing treated soil in newly excavated and lined onsite landfill followed by capping; collecting GW using a seep interceptor with offsite treatment; performing GW verification study; and providing deed notices to property owners	Soil will be excavated until organics are undetectable (< 50 mg/kg). GW performance levels include benzene 0.005 mg/l (MCL), phenols 3.5 mg/l (AWQC), chromium 0.05 mg/l (MCL), and lead 0.05 mg/l (MCL)	$5,188,000 (present worth) $124,000 (annual O&M years 1-30)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Croydon TCE, PA TCE Spill Site 12/28/88 1st	GW contaminated with VOCs including TCE and PCE	Not specified	Provision of an alternate water supply to 13 residences; and GW monitoring	Remedy prevents exposure to concentrations of TCE in excess of Federal, State, and local health-based ARARs	$106,000 (present worth) $3,400 (annual O&M years 1-30)
III	CryoChem, PA Fabricating Facility 09/29/89 1st	GW contaminated with VOCs including TCE and PCE	Not applicable	Installation of dual-activated carbon adsorption units or continued maintenance of existing carbon units at affected homes until a permanent clean water supply is developed; implementation of periodic sampling at potentially affected homes; construction of a new uncontaminated water supply to serve affected and potentially affected homes and businesses; and periodic sampling of residences outside the affected area	GW will meet SDWA MCLs or an excess cancer-risk level less than 10^{-6} if an MCL has not been developed for a particular chemical. Target cleanup levels for GW include TCE 5 ug/l (MCL) and PCE 0.66 ug/l (based on a 10^{-6} cancer risk)	$1,260,000 (present worth) $80,000 (annual O&M)
III	Douglassville Disposal, PA 50-Acre Abandoned Waste Oil Processing Facility 06/30/89 2nd - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and vinyl chloride; other organics including PAHs, PCBs, and phenols; and metals including lead	48,400 yd^3 (soil and sludge) 600 yd^3 (sediment)	Excavating and incinerating soil and sludge followed by backfilling ash residue onsite, with possible solidification prior to onsite disposal; covering backfilled area and revegetating, capping other source areas and revegetating; conducting test burns; treating and disposing of scrubber wastes from thermal treatment; implementing institutional controls and access restrictions; GW and SW monitoring; and establishing ACLs for GW	Soil will be treated if it exceeds a 10^{-6} cancer-risk level. GW standards will be ACLs and will be established at maximum existing concentrations for monitoring wells. ACLs include benzene 2,000 ug/l, toluene 2,300 ug/l, vinyl chloride 1,200 ug/l, phenols 7.1 ug/l, and lead 227 ug/l. If GW concentrations exceed ACLs, remediation may be necessary. Lead emissions into the air will not exceed NAAQS and State air quality standards, set at 1.5 ug/m^3 (on a quarterly average)	$39,430,000-$53,769,000 (present worth) $0 (O&M) $150,000 (5-year review present worth)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Havertown PCP, PA Wood Treatment Facility 09/29/89 1st	SW contaminated with VOCs including benzene, toluene, and TCE; other organics including phenols, dioxins, PCP, and PAHs; metals including chromium; and oils	200 drums (soil and oily debris) 6,000 gals (wastewater)	Offsite land disposal of drums filled with soil and oily debris; offsite treatment and disposal of wastewater stored onsite in tanks; soil monitoring; installation and operation of an oil/water separator at the storm sewer effluent point to SW; multi-media monitoring; and implementation of site access restrictions	Cleanup goals are based on a 10^{-6} risk level. Specific SW cleanup goals include reducing the discharge of PCP-contaminated oil to nearby creek to less than 5 mg/l and reducing the VOC concentrations by 17%	$1,158,200 (present worth) $110,000 (O&M years 1-5) $45,000 (O&M years 6-30)
III	Hebelka Auto Salvage Yard, PA 20-Acre Automobile Disposal Area 03/31/89 1st	Soil and debris (battery casings) contaminated with metals including lead	5,000 yd^3 (soil) 1,000 yd^3 (debris)	Excavation and onsite fixation of soil followed by offsite disposal; excavation and recycling of battery casings; and soil backfilling and revegetation	Soil will be excavated down to a lead concentration of 560 mg/kg based on health-risk calculations which consider a safe soil ingestion scenario	$6,073,436 - $6,884,652 (present worth) $0 (O&M)
III	Henderson Road, PA Industrial Landfill 09/29/89 2nd - Final	The injection well operable unit is contaminated with VOCs including PCE, TCE, toluene, and benzene; and other organics including PAHs	2,735 yd^3 (soil) 5,230 yd^3 (debris) 2,500,000 gals (leachate)	Installation of erosion controls, regrading and capping, including possibly moving the onsite water main; installation of a short- and long-term leachate collection system with treatment and discharge to be determined; excavation and movement of trash, soil, and cinder currently located at the adjacent Turnpike property, to the Henderson Road site, with appropriate remediation of wastes left in place at the Turnpike property; further sample collection in the western portion of the site to determine treatment and/or capping in that area, and contingent GW recovery; GW and leachate monitoring; and implementation of institutional controls	Cleanup goal for soil is based on depth of soil rather than concentration level. GW standards include benzene 5.0 ug/l (MCL), toluene 2,000 ug/l (PMCL), PCE 5.0 ug/l (PMCL), TCE 5.0 ug/l (MCL) and PAHs 2.5 ug/l (CLP detection limit)	$7,265,000 (present worth) $213,260 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Kimberton Site, PA Industrial Facility 06/30/89 2nd - Final	GW and SW contaminated with VOCs including TCE and DCE	Not specified	Continued provision of alternate water supplies through GAC treatment system and/or potable water supply storage tanks; GW pumping and treatment using air stripping with onsite discharge to an adjacent stream; GW monitoring; SW collection and treatment using air stripping; and implementation of institutional controls restricting GW use	GW remediation goal is to achieve natural background conditions. GW will gradually meet MCLs including TCE 5 ug/l and DCE 7 ug/l. SW will meet AWQC including TCE 21,900 - 45,000 ug/l and DCE 11,600 ug/l. Air emissions from air stripping will comply with State air toxic guidelines	$2,630,000 (present worth) $175,000 (annual O&M)
III	M.W. Manufacturing, PA Industrial Facility 03/31/89 1st	Soil contaminated with VOCs including PCE and TCE; other organics including PCBs; and metals including lead	875 yd^3 (waste pile and soil)	Excavation of carbon waste pile and underlying soil with transportation to an offsite incineration facility and disposal of ash in a RCRA landfill	Soil excavation will be based on visible contamination. Carcinogens will be treated to < 2 ug/kg for individual contaminants, which corresponds to the 10^{-4} to 10^{-6} risk range	$2,061,000 (capital) $0 (annual O&M)
III	New Castle Spill, DE Former Manufacturing Facility 09/28/89 1st - Final	GW contaminated with tris (2-chloropropyl)- phosphate	Not specified	Natural attenuation; GW, SW, and sediment monitoring; and implementation of institutional controls restricting further well installation in the shallow aquifer	Because there are no ARARs for tris (2-chloropropyl)-phosphate, EPA has established a TBC criterion of 4.4 mg/l which is based on an average daily intake of 0.125 mg/kg/day of tris (2-chloropropyl)-phosphate	$466,147 (present worth) $25,000 (O&M)
III	Ordnance Works Disposal Areas, WV Chemical Facilities 09/29/89 1st (Amendment)	Soil and sediment contaminated with organics including cPAHs; and metals including arsenic and lead	13,885 yd^3 (soil)	Excavation and onsite treatment of inorganic-contaminated soil using solidification, followed by placement of treated soil in landfill before capping; installing RCRA cap on landfill, regrading, and revegetation; excavation of organic-contaminated soil and sediment with onsite treatment by bioremediation; GW, SW and sediment monitoring; and implementation of deed restrictions	Cleanup goals for carcinogens are based on a 10^{-6} excess risk level and include cPAHs 44.7 mg/kg, arsenic 88.8 mg/kg, and lead 500 mg/kg	$8,332,000 (present worth)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Publicker/ Cuyahoga Wrecking, PA 37-Acre Abandoned Manufacturing Facility 06/30/89 1st	Soil and GW contaminated with VOCs and other organics including PCBs and pesticides	852,275 gals (waste stream) 20 yd^3 (debris)	Offsite treatment and disposal of waste streams in RCRA-permitted facilities; demolition of above-ground process lines with proper packaging of contaminated insulation and onsite storage pending disposition in a subsequent remedial action; and offsite disposal of hazardous chemicals recovered from within the lines	The selected remedy will stabilize the site and remove the threat associated with fire and/or explosion by removing and disposing of waste streams offsite. No chemical-specific goals were provided	$13,900,000 (capital) $0 (O&M)
III	Reeser's Landfill, PA 15-Acre Municipal/ Industrial Landfill 03/30/89 1st - Final	None	Not applicable	No action remedy with GW review within five years	Not applicable	Not specified
III	Strasburg Landfill, PA 222-Acre Industrial/ Municipal Landfill 06/29/89 1st	GW and SW contaminated with VOCs including TCE, PCE, toluene, and xylenes	Not specified	Leachate collection with an interceptor drain and offsite treatment; and provision of an alternate water supply using point-of-use activated carbon treatment system	Treated GW concentrations for carcinogenic contaminants will be such that the aggregate carcinogenic risk would be $<10^{-6}$. Target GW concentrations for non-carcinogenic contaminants will ensure an HI <1. MCLs are ARARs and may be considered target levels. Because of an ARAR waiver for leachate, no chemical-specific cleanup goals were specified for leachate seep	$42,850 (capital) $4,500 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Whitmoyer Laboratories, PA Industrial Facility 06/30/89 1st	Concentrated liquids contaminated with VOCs including PCE and metals including arsenic	69,000 gals (concentrated liquid wastes)	Consolidating, transporting offsite, and treating concentrated liquid wastes using thermal treatment, biodegradation, or recycling at a RCRA-permitted facility, followed by disposal of treated water in offsite SW and disposal of solid residuals in an offsite landfill; decontaminating tanks and piping to meet RCRA closure standards; and treating and disposing of cleaning agent residuals offsite at RCRA-permitted facilities	This interim remedial action will comply with ARARs; however, chemical-specific cleanup levels were not provided	$475,000 (capital) $0 (O&M)
III	Wildcat Landfill, DE 2.7-Acre Landfill Pond 11/28/88 2nd - Final	Sediment and GW contaminated with metals including arsenic, chromium, and lead	Not specified	Draining, filling and revegetating pond; constructing a new pond onsite; implementing institutional controls including land use restrictions; and GW monitoring	Remedy will ensure Federal water quality criteria are not exceeded when discharging SW. Quantitative cleanup goals are not applicable	Not specified (remedy will be implemented as part of first operable unit construction)
IV	Aberdeen Pesticide Dumps/ Fairway Six, NC Pesticide Disposal Site 06/30/89 1st	Soil and debris contaminated with organics including pesticides	22,000 yd^3 (soil and debris)	Excavating and homogenizing pesticide-contaminated wastes with onsite incineration; reinjecting process wastewater or scrubber blowdown into thermal treatment facility; analyzing ash residues with onsite redisposal; and air emissions monitoring	The air pollution control system will achieve performance standards which are defined as hydrogen chloride <4 pds/hr and particulate matter of <0.08 grains/dry ft^3 in the exhaust gas connected to 7% oxygen content	$14,533,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	American Creosote (Jackson Plant), TN Wood Preserving Facility 01/05/89 1st	Sludge, structures and debris, and tanked liquids contaminated with VOCs and other organics including phenols and PAHs	115,000 gals (sludge) 25,000 gals (oil) 500,000 gals (tanked liquids)	Consolidation and incineration of sludge around the buildings and tanks; on- or offsite incineration of oils and sludge from the tanks; onsite treatment of tanked process liquids using a sand filter, filter press, and carbon adsorption unit followed by discharge to SW; decontamination and offsite disposal of site structures; construction of a flood-protection dike; fencing; and site stabilization pending final remedy including monitoring onsite water levels behind the dikes; pumping, treatment (if needed), and discharge of impounded water; and implementation of institutional controls including deed restrictions	Remedy is geared towards reducing potential for direct exposure to sludge and process liquids while further information is gathered and analyzed. Quantitative goals were not provided for final site remediation	$5,000,000 - $6,000,000 (present worth) O&M not specified
IV	American Creosote (Pensacola Plant), FL Former Wood Preserving Facility 09/28/89 2nd	Soil contaminated with organics including PAHs, dioxins, and PCP	23,000 yd^3 (surface soil)	Excavating and treating soil using solid-phase bioremediation in an onsite land treatment area followed by onsite disposal; implementing temporary erosion control measurese, to preserve SW quality; filling and leveling land treatment area with clean fill; collecting leachate and spraying over treatment area to moisten soil; oxygen, pH, nutrient and soil moisture content monitoring, and implementing land and GW use restrictions	Soil cleanup levels are based on cancer potency factors and a 10^{-5} excess cancer risk for carcinogens. Soil cleanup goals include cPAHs 50 mg/kg (based on risk assessment and persistence in the environment), dioxins 2.5 ug/kg (based on modified CPF), and PCP 30 mg/kg	$2,275,000 (present worth) $319,000 (O&M)
IV	Amnicola Dump, TN 18-Acre Disposal Area 03/30/89 1st - Final	Soil, debris, and GW contaminated with organics including PAHs and metals including chromium	400 yd^3 (soil) 200 yd^3 (debris)	Excavation and screening of contaminated soil and debris, followed by onsite solidification/fixation and onsite disposal; GW monitoring; conducting a public health assessment five years after completion; and imposing institutional controls including land and GW use restrictions	Soil will be treated to the health-based level of 100 mg/kg for total cPAHs. GW will meet ACLs including chloroform 86 ug/l and chromium 890 ug/l through GW use restrictions	$640,000 (present worth) $384,000 (total O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Cape Fear Wood Preserving, NC Wood Treatment Facility 06/30/89 1st - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene; other organics including PAHs; and metals including arsenic and chromium	15,000 gals (wastewater)	Offsite disposal at a RCRA landfill of CCA salt crystals found in the drainage system and solidified creosote; offsite disposal of asbestos-containing pipe insulation at the county solid waste facility; removal and decontamination of onsite pipes and tanks; excavation and onsite treatment of soil and sediment using soil flushing as the preferred alternative or a low thermal desorption process to remove organics followed by soil washing or fixation/stabilization/solidification to address inorganics (a soil washing treatability study will determine if the preferred alternative would be appropriate) followed by placement in excavated area and revegetation; GW and SW pumping with onsite treatment followed by offsite discharge at a POTW or surface stream; sale or treatment of CCA solution; and GW monitoring	Soil cleanup criteria include arsenic 94 mg/kg (risk assessment), benzene 0.005 mg/kg (CLRQL), chromium 88 mg/kg (background), cPAHs 2.5 mg/kg (risk assessment) and total PAHs 100 mg/kg (background); for sediment, total PAHs 3 mg/kg (EPA-established biota protection level), arsenic 94 mg/kg (risk assessment), and chromium 88 mg/kg (background); and for GW, benzene 5 ug/l (MCL), cPAHs 10 ug/l (CLRQL), and noncarcinogenic PAHs 14,350 ug/l (risk assessment); for SW, arsenic 12 ug/l (AWQL), chromium 11 ug/l (AWQL), and copper 14 ug/l (background)	$14,370,000 - $14,910,000 (present worth) $1,020,000 - $1,310,000 (present worth O&M years 1-30)
IV	Carolawn, SC Abandoned Waste Storage and Disposal Facility 09/27/89 1st	GW contaminated with VOCs including TCE and metals including lead	Not specified	GW pumping and treatment using one or more of the following methods: air stripping, biodegradation, activated carbon filtration, and metals removal, with method selection based on contaminant level found and the treated GW discharge point selected; plugging condemned wells; disposing two inactive incinerators and two remaining drums; GW and soil monitoring, and implementing deed restriction	GW will meet SDWA MCLs. Target cleanup levels include TCE 5 ug/l and lead 5 ug/l	$1,141,071 - $1,356,305 (present worth) $753,433 - $916,723 (present worth O&M years 1-30)
IV	Celanese (Shelby Fiber Operations), NC Waste Disposal Site 03/28/89 2nd - Final	Soil, stream sediment, sludge, and other waste contaminated with VOCs including benzene and TCE; other organics including phenols and PAHs; and metals including lead and chromium	110 yd^3 (sediment) 1,800 yd^3 (sludge) 1,800 yd^3 (other wastes)	Excavation of soil, sediment, GRU sludge, and other wastes with onsite incineration of contaminated soil and GRU sludge and chemical fixation (solidification) of incinerator ash, burn pit residue, stream sediment, and other wastes followed by onsite disposal of inert solidified material; regrading excavated area; and GW monitoring	The selected remedy will attain a 10^{-6} cancer-risk level as it removes the source of GW contamination. No chemical-specific goals were provided	$3,500,000 (present worth) O&M not specified

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Chemtronics, NC 1,027-Acre Waste Disposal Facility 04/26/89 1st (Amendment)-Final	Soil, sediment, GW, and SW contaminated with VOCs including TCE, PCE, toluene, and benzene; other organics including PCBs and pesticides; metals including chromium and lead; and explosives	Not specified	Multi-layer capping of disposal areas; GW pumping and treatment using air stripping, carbon adsorption, or metal removal with treatment and discharge to be determined during design; SW treatment using GW treatment system and onsite disposal of sediment; sediment, GW, and SW monitoring; and implementation of institutional controls and access restrictions	GW cleanup levels are based on MCLs/PMCLs and several TBCs. Individual goals include: TCE 0.005 mg/l (MCL), benzene 0.005 mg/l (MCL), PCE 0.007 mg/l (RSD), toluene 2.0 mg/l (PMCLG), RDX 0.035 mg/l (USAIWQC), TNT 0.044 mg/l (PPLV), lead 0.05 mg/l (TSCA), and chromium 0.05 mg/l. Individual soil cleanup goals include PCBs 10 mg/kg, RDX 95 mg/kg, TNT 305 mg/kg, and CS 43.3 mg/kg (PPLV)	$2,248,900 (present worth) $501,900 (annual O&M)
IV	Ciba-Geigy (McIntosh Plant), AL Manufacturing Facility 09/28/89 1st	GW contaminated with VOCs including benzene and toluene; other organics including pesticides; and metals including arsenic	Not specified	No further action beyond continued GW pumping and treatment using an existing biological wastewater treatment system, followed by discharge to SW; and GW and effluent monitoring	GW cleanup goals will be attained by continued use of the existing GW pumping and treatment system. GW cleanup goals include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), and arsenic 50 ug/l (MCL)	$0 (capital) $325,000 (annual O&M)
IV	Kassauf-Kimerling Battery, FL 1-Acre Landfill 03/31/89 1st	Soil, debris, and GW contaminated with metals including arsenic, cadmium, and lead	11,350 yd^3 (soil and debris)	Excavation of landfill wastes and underlying soil followed by solidification/chemical fixation and onsite disposal in the landfill	Soil and debris in the source area will be treated to meet RCRA criteria including EP toxicity concentrations. GW will meet MCLs and AWQC over a short period of time due to excavation and fixation of the landfill materials	$2,500,000 - $3,500,000 (present worth) O&M not specified

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Newsom Brothers/ Old Reichhold, MS Wood Preserving Facility 09/18/89 1st - Final	Soil, sediment, and bulked wastes contaminated with organics including PAHs, PCBs, and PCP; and metals	30,300 yd^3 (soil) 7,300 yd^3 (sediment) 650 yd^3 (waste material)	Excavation and offsite disposal of contaminated soil and sediment; excavation and offsite incineration of waste materials and any soil/sediment containing RCRA hazardous waste, followed by offsite disposal; draining, filling, and capping onsite ponds; recontouring site; and GW monitoring	Soil, sediment, and waste material cleanup goals are based on a 10^{-6} excess cancer risk. Goals include cPAHs 10 mg/kg and PCP 1.2 mg/kg	$14,180,000 (present worth) $520,225 (present worth O&M)
IV	Smith's Farm, KY 80-Acre Hazardous Waste Disposal Area 09/29/89 1st	Soil and sediment contaminated with organics including PAHs and PCBs; and metals including lead	26,200 yd^3 (soil) 5,200 yd^3 (sediment)	Site remediation is divided into 2 areas, Area A and Area B and includes excavation and onsite incineration of soil; sediment, debris, and fill material from Area B; solidification/fixation of approximately 50% of treated material followed by onsite placement of all treated material in Area B; incineration of a small amount of hotspot material and consolidation in Area A; construction of RCRA cap over Area A; construction of a leachate collection system; maintenance of RCRA cap and leachate collection system; leachate removal and disposal for 30 years; GW monitoring; and implementation of site access restrictions	Action levels for contaminated soil and/or sediment are based on an excess lifetime cancer risk of 10^{-5} with the exception of lead, which was based on an HI <1.0. Chemical-specific goals include cPAHs 5 mg/kg, PCBs 2 mg/kg, and lead 500 mg/kg	$26,900,000 (present worth) $1,330,000 (O&M)
IV	Stauffer Chemical (Cold Creek Plant), AL Chemical Manufacturing Facility 09/27/89 09/27/89 1st	GW contaminated with VOCs including carbon tetrachloride and other organics including pesticides	Not specified	Continued operation of the existing intercept/treatment system; installation of additional extraction/monitoring wells; modification of treatment system; and monitoring of effluent, GW concentrations, and pumping rates	GW cleanup levels are based on SDWA MCLs or RfDs and include carbon tetrachloride 5 ug/l (MCL)	$3,119,200 (capital) O&M not specified

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Stauffer Chemical (LeMoyne Plant), AL Chemical Manufacturing Facility 09/27/89 1st	GW contaminated with VOCs including carbon tetrachloride and other organics including pesticides	Not specified	Continued operation of the existing intercept/treatment system; installation of additional extraction/monitoring wells; modification of treatment system; and monitoring of effluent, GW concentrations, and pumping rates	GW cleanup levels are based on SDWA MCLs or RfDs and include carbon tetrachloride 5 ug/l (MCL)	$3,119,200 (capital) O&M not specified
IV	Sydney Mine Sludge Ponds, FL Former Waste Disposal Pits 09/29/89 1st - Final	GW contaminated with VOCs including benzene, toluene, TCE and xylenes	Not specified	Remedy includes continued GW pumping and onsite treatment by air stripping and spray irrigation on land adjacent to the disposal pits; evaluation of existing GW pumping and treatment system with implementation of any necessary modifications; GW monitoring, and implementation of deed and GW use restrictions	Cleanup goals were set according to State drinking water standards and SDWA MCLs and PMCLs. Chemical-specific cleanup goals include benzene 1 ug/l (PDWS) and toulene 2,000 ug/l (PMCL)	$2,448,000 (present worth) $576,000 (annual O&M)
V	Adrian Municipal Well Field, MN Municipal Well Field 09/29/89 1st - Final	Soil and GW contaminated with petroleum-related releases	Not applicable	No further action will be taken by the Superfund program because the program does not have the authority to address cleanup of petroleum releases. EPA will transfer the site to its UST program for further action	Not applicable	$0 (present worth) $0 (O&M)
V	Alsco Anaconda, OH 4.8-Acre Former Sludge Disposal Area 09/08/89 1st	Soil and sludge contaminated with organics including PCBs; and metals including chromium, cyanide, and arsenic	8,870 yd^3 (soil and sludge)	Excavating sludge contaminated with >500 mg/kg of PCBs followed by offsite incineration and disposal; excavating sludge and soil contaminated with <500 mg/kg of PCBs followed by offsite treatment and disposal or reuse; backfilling and revegetating excavated areas; and implementing institutional controls including site access and deed restrictions	Soil cleanup goals will meet clean closure levels, which require soil and sludge to be excavated until remaining soil contaminant concentrations attain a cumulative HI value <1 for critical effect. Chemical-specific cleanup goals were not specified, but will be established during the remedial design	$4,161,066 (capital) $0 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Auto Ion Chemicals, MI Industrial Waste Treatment Facility 09/27/89 1st	Soil contaminated with organics including PAHs; and metals including arsenic, chromium, and lead	7,200 yd^3 (soil)	Excavation and offsite stabilization of contaminated soil, followed by offsite disposal of treated soil; and replacement of excavated soil with clean fill	Soil will be treated to meet a total carcinogenic risk level of 10^{-6} and must pass the TCLP test before offsite disposal. Individual contaminant goals were not specified	$3,332,988 (capital) $5,900 (annual O&M)
V	Big D Campground, OH 1.2-Acre Landfill 09/29/89 1st - Final	Soil and GW contaminated with VOCs including PCE and TCE; other organics; and metals including chromium and lead	2,500-5,000 (drums) 25,000-30,000 yd^3 (soil) 40,000,000 - 60,000,000 gals (GW)	Removing and incinerating drums, bulk wastes, and soil followed by onsite disposal of nonhazardous ash residues; GW pumping and treatment using GAC followed by onsite discharge to SW; GW and SW monitoring; and implementing deed and land use restrictions	Remedial action will reduce health risks identified in GW to an HI ≤ 1.0 and a cumulative carcinogenic risk of 10^{-6} or less. GW cleanup goals are based on MCLs and include TCE 5 ug/l and chromium 50 ug/l	$39,000,000 (present worth) $320,000 (annual O&M)
V	Bowers Landfill, OH Municipal/ Industrial Landfill 03/24/89 1st - Final	Soil, sediment, debris, and GW contaminated with VOCs including PCE and benzene; other organics including PAHs and PCBs; metals including lead and chromium; and other inorganics	Not specified	Removal of surface vegetation and debris, followed by offsite disposal at a hazardous waste landfill or a solid waste landfill; erosion controls including surface regrading in areas prone to flooding and erosion; excavation and dewatering of drainage ditch sediment followed by onsite disposal; replacement of discharge pipe; construction of a soil and clay cap; GW monitoring; and implementation of site access and GW use restrictions	Chemical-specific cleanup goals were not provided; however, cleanup levels will be based on MCLs where available and a 10^{-6} cancer risk for all other contaminants	$4,300,000 (present worth) $116,000 (annual O&M years 1-30)
V	Byron Salvage Yard, IL Waste Disposal/ Dumping Area 06/30/89 3rd	GW contaminated with VOCs including benzene, PCE, and TCE; metals including arsenic, chromium, and lead; and other organics including cyanide	Not specified	Removing wastes generated during the remedial investigation; covering, regrading, and revegetating surface; GW and SW monitoring; plugging and abandoning monitoring wells no longer in use; providing an alternate source of drinking water by extending the water main of the municipal system; and implementing institutional controls including GW use and deed restrictions	Cleanup levels will be based on ACLs, which will be set at contaminant concentrations currently found in the aquifers. AWQC and/or State water quality standards will be attained in nearby pond and river	$1,100,000 (present worth) $16,000 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Cemetary Dump, MI Former Chemical Dumping Area 09/29/89 2nd - Final	None	Not applicable	No further action is necessary because previous remedial activities appear to provide adequate protection. GW will be monitored annually to ensure the site continues to pose no threat to human health	Not applicable	$0 (present worth) $0 (O&M)
V	Cliffs/Dow Dump, MI Tar Waste Disposal Area 09/27/89 1st - Final	Soil contaminated with VOCs including benzene, toluene, PCE, and xylenes; and other organics including PAHs and phenol	9,600 yd^3 (tar waste)	Excavation and offsite incineration of 200 yd^3 of exposed tars; excavation and biological treatment of 9,400 yd^3 of residual contaminated fill material followed by offsite incineration of 200 yd^3 of buried tars; in-situ biodegradation of residual contaminated fill material; installation of a soil cover and revegetation of bioremediated fill area; GW and air monitoring; and implementation of deed restrictions to prevent new well installation and disturbance of the fill materials	GW contaminant levels, which are already below levels of concern, will further decrease through biodegradation and natural attenuation. No chemical-specific goals were provided for source control	$2,842,165 (present worth) $63,280 (annual O&M)
V	Cross Brothers Pail (Pembroke), IL Drum and Pail Recycling Facility 09/28/89 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; and other organics including PCBs	33,880 yd^3 (soil)	Resampling PCB-contaminated soil followed by excavation and offsite incineration of soil with a PCB level >10 mg/kg; covering a 10-acre portion of the site; GW pumping and treatment with onsite discharge to VOC-contaminated soil area for soil flushing; GW monitoring; and implementation of deed and access restrictions	GW cleanup goals will meet MCLs, not exceed a 10^{-6} lifetime cancer risk, and attain an HI ratio ≤ 1.0. PCB-contaminated soil will be excavated until PCBs levels are <10 mg/kg (based on TSCA Spill Policy)	$2,076,500 (present worth) $59,235 (annual O&M years 1-15)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	E.H. Schilling Landfill, OH 2.7-Acre Landfill 09/29/89 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including phenol, PAHs, and pesticides; and metals including arsenic	30,000 yd^3 (subsurface soil under landfill) 750 yd^3 (surface soil to be excavated) 70,000 yd^3 (solid waste beneath landfill) 500 yd^3 (sediment to be excavated) 7,000,000 gals (leachate)	Excavation of sediment and soil for consolidation in landfill; construction of RCRA cap; construction of clay berm; construction of a perimeter cut-off wall; construction of interceptor drum; dewatering the landfill of leachate and treating leachate using air stripping and carbon adsorption to remove organics and sulfide precipitation to remove inorganics, followed by discharge to SW; treatment and discharge of additional wastewater generated during remedial action; GW monitoring; and implementation of site access and deed restrictions	Soil and sediment will be excavated and consolidated to achieve a cumulative carcinogenic risk $<10^{-6}$ and a cumulative non-carcinogenic HI <1.0. GW will be treated if it exceeds action levels that have been established as a cumulative cancer risk $<10^{-6}$ and a cumulative noncarcinogenic HI <1.0	$6,444,000 (capital) $99,000 (annual O&M years 1-30)
V	Galesburg/ Koppers, IL Wood Treatment Facility 06/30/89 1st - Final	Soil and GW contaminated with organics including phenols, PCP, and PAHs	15,200 yd^3 (soil)	Excavation and onsite consolidation with onsite biological treatment of soil; implementation of a biological monitoring program; construction of shallow GW interceptor trenches and deep pumping wells with GW pumping and pretreatment using existing wastewater treatment system, followed by discharge to a POTW; GW monitoring; and implementation of access and land use restrictions	No chemical-specific soil cleanup goals were established. Soil will be excavated 6" beyond visible contamination and will be treated to background toxicity levels. GW cleanup levels are based on a 10^{-6} excess carcinogenic risk goal	$4,286,844 (present worth) $170,012 (annual O&M)
V	Hedblum Industries, MI Manufacturing Facility 09/29/89 1st - Final	GW contaminated with VOCs including benzene, toluene, xylenes, TCE, and PCE; and metals including lead	Not specified	GW pumping and treatment using activated carbon adsorption with discharge to the bayou; and GW and soil monitoring	Cleanup goals will meet SDWA MCLs. Specific goals include benzene 5 ug/l, TCE 5 ug/l, and lead 50 ug/l	$1,379,000 (present worth) $264,000 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Industrial Excess Landfill, OH Former Mixed Industrial and Refuse Landfill 07/17/89 2nd – Final	Soil, sediment, GW, and air contaminated with organics including methane gas and metals	256,000,000 gals (GW)	Capping landfill with RCRA cap; expanding existing methane venting system; GW pumping and treatment by air stripping, carbon adsorption; and flocculation/ sedimentation/filtration to achieve compliance with CWA discharge criteria; treating SW from ponds and ditch, if necessary; dredging and consolidating sediment from ponds and ditch under the cap; multi-media monitoring; and implementing institutional controls restricting future use of the site	Landfill gas concentrations beyond the site will not exceed 5% methane. GW cleanup is based a 10^{-6} excess cancer risk level and will be treated to achieve SDWA MCLs in the aquifer and discharged in compliance with CWA NPDES requirements. Specific GW cleanup goals include benzene 5 ug/l and vinyl chloride 2 ug/l	$18,548,000 (present worth) $440,000 (annual O&M)
V	Ionia City Landfill, MI 20-Acre Industrial, Commercial and Municipal Landfill 09/29/89 1st	Soil and debris contaminated with VOCs including vinyl chloride and methyl chloride; other organics; and metals including chromium	5,000 yd^3 (soil and drummed wastes)	In-situ vitrification of point source area; GW monitoring; upgrading landfill cover; implementing access and land use restrictions	Target cleanup levels for the soil-matrix to determine extent of excavation will not be established; instead, the extent of excavation will be based on the extent of buried drums and results of additional sampling	$3,630,525 (present worth) $112,750 (annual O&M year 1) $51,000 (annual O&M years 2–10)
V	Kysor Industrial, MI Industrial Facility 09/29/89 1st – Final	Soil and GW contaminated with VOCs including PCE, toluene, xylenes, and TCE; and metals including chromium	Not specified	GW pumping and treatment using carbon adsorption and air stripping with vapor-phase carbon adsorption followed by offsite discharge to SW; in-situ soil vacuum extraction with air pollution control equipment; GW monitoring; and implementation of site access and GW and land use restrictions	GW cleanup goals are derived from State and SDWA MCL standards. Specific goals include PCE 1 ug/l, xylenes 440 ug/l, toluene 40 ug/l, TCE 5 ug/l, and chromium (hexavalent) 50 ug/l. Soil cleanup goals are derived from State and RCRA standards. Specific goals include xylenes 141 mg/kg, toluene 724 mg/kg, and TCE 0.07 mg/kg	$16,000,000 (present worth) $5,000,000 (present worth O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Laskin/Poplar Oil, OH Waste Oil Disposal Facility 06/29/89 3rd - Final	Soil, structures, and debris contaminated with organics including PCBs, PAHs, dioxin, and pesticides; and metals including lead	Not specified	Draining onsite freshwater and retention ponds with offsite discharge and refilling; thermally treating contaminated soil, ash, and debris with either onsite disposal of ash or offsite disposal in RCRA landfill; demolishing and thermally treating or decontaminating dioxin-contaminated structures; constructing an up-gradient GW diversion trench; capping, GW and SW monitoring; and implementing access and land use restrictions	No specific cleanup goals were provided; however, remediation goals, will prevent exposure to soil and debris exceeding a 10^{-6} cancer-risk level or a total HI >1	$11,000,000 (present worth) $1,000,000 (present worth O&M)
V	MIDCO I, IN Industrial Waste Recycling, Storage, and Disposal Facility 06/30/89 1st - Final	Soil, sediment, and GW, contaminated with VOCs including benzene, toluene and TCE; other organics including PCBs, phenols, and PAHs; metals including chromium and lead	12,400 yd^3 (soil) 1,200 yd^3 (sediment)	Treatment of soil and subsurface materials using a combination of vapor extraction and solidification/stabilization followed by onsite disposal; excavation and onsite solidification/stabilization of sediment in wetlands; and covering the site in accordance with RCRA landfill closure requirements. GW will be recovered and handled in one of the following ways: 1) deep well injection without treatment if EPA grants a petition to allow land disposal of waste prohibited under RCRA; 2) if a petition is not approved, GW will be treated using air stripping and a liquid-phase granular activated carbon polish system, followed by deep well injection; or 3) treatment for hazardous substances followed by reinjection into the aquifer in a manner that will prevent spreading of the salt plume; and implementation of site access and deed restrictions	Soil and sediment will be treated if they exceed one of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-6}, cumulative chronic noncarcinogenic index equal to 1.0, or subchronic risk index equal to 1.0. GW will be treated if it exceeds one of the following risk-based levels: cumulative lifetime cancer risk equal to 10^{-5}, cumulative noncarcinogenic index equal to 1.0, subchronic risk equal to 1.0, MCLs, or chronic AWQC multiplied by a 3.9 dilution factor	$10,728,000 - $13,989,000 (present worth) $188,000 - $525,000 (annual O&M) Costs depend on whether GW is treated

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	MIDCO II, IN 7-Acre Waste Storage and Disposal Facility 06/30/89 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, TCE and xylenes; other organics including PCBs; and metals including arsenic, chromium, and lead	35,000 yd^3 (soil and waste materials) 500 yd^3 (sediment)	Treatment of soil and waste materials using solidification/stabilization followed by onsite disposal; excavation and onsite solidification/stabilization of sediment; covering site in accordance with RCRA landfill closure requirements. GW will be recovered and handled in one of the following ways: 1) deep well injection without treatment, if EPA grants a petition to allow land disposal of waste prohibited under RCRA; 2) if petition is not granted, GW will be treated using air stripping and a liquid phase granular activated carbon polish system, followed by deep well injection; or 3) treatment for hazardous substances followed by reinjection into the aquifer in a manner that will prevent spreading of the salt plume; and implementation of site access and deed restrictions	Soil and sediment will be treated if they exceed one of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-5}, cumulative chronic non-carcinogenic index equal to 1.0, or subchronic risk index equal to 1.0. GW will be treated if it exceeds a 10^{-5} cancer-risk level, cumulative non-carcinogenic index equal to 1.0, subchronic risk equal to 1.0, MCLs, or chronic AWQC multiplied by a 3.6 dilution factor	$14,419,000 - $18,596,400 (present worth) $301,000 - $733,000 (annual O&M) Costs depend on whether GW is treated
V	Miami County Incinerator, OH Incinerator/ Waste Disposal Facility 06/30/89 1st - Final	Soil and GW contaminated with VOCs including PCE, toluene, and TCE; other organics including PCBs, PAHs, dioxin, and pesticides; and metals including lead	104,000 - 150,000 barrel-equivalents (liquid waste)	Excavation and onsite consolidation of ash wastes and soil into landfills with capping of landfills and previously excavated areas; GW pumping and treatment with discharge to POTW; vapor/vacuum extraction of liquid disposal area using carbon filters; continued testing of soil, ash, and tributary sediment; provision of an alternate water supply for area residents and businesses; and implementation of deed and land use restrictions	No chemical-specific cleanup goals have been established at this time. Cleanup levels will be based on MCLs, an HI of 1, a 10^{-5} cancer-risk level at the waste boundary, and a 10^{-6} cancer-risk level at the nearest receptor	$19,400,000 (present worth) $4,666,000 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	New Brighton/ Arden Hills (TCAAP), MN Federal Facility Army Ammunition Manufacturing Plant 07/19/89 7th	Soil contaminated with VOCs including TCE and PCE; other organics including PCBs; and metals including arsenic and lead	1,400 yd^3 (soil)	Onsite treatment of soil using mobile infrared thermal treatment; analysis of treated soil to ensure PCB treatment goal is met, followed by onsite treatment; discharge of treated scrubber wastewater to sanitary sewer system and ultimately to POTW; decontamination and removal of equipment used in treatment process; and air monitoring during soil treatment	Soil will be treated to reach 2 mg/kg PCBs as required under TSCA	$1,200,000 (total cost)
V	New Brighton/ Arden Hills, MN Municipal Well Field 08/11/89 4th (Amendment)	None	Not applicable	Amend June 1986 ROD by cancelling the installation of a new municipal well	Not applicable	$0 (present worth) $0 (O&M)
V	Ninth Avenue Dump, IN Waste Disposal Area 06/30/89 2nd - Final	Soil, sediment, fill material, and GW contaminated with VOCs including benzene, TCE, and toluene; other organics including PAHs and PCBs; and metals including lead	36,000 yd^3 (fill material) 1,000-2,000 drums (liquid waste)	Excavation of oil-contaminated waste and fill material with onsite thermal treatment, followed by filling the excavated area with incinerator and GW treatment process residues, discarded drums, sediment, and trench spoils; capping area contained by the slurry wall; pumping and treatment of GW inside slurry wall with reinjection into slurry wall to promote soil flushing; dismantling, decontaminating, and removing oil storage unit constructed under first O.U.; long-term GW monitoring; and implementation of deed and access restrictions	Soil remedy is designed to ensure long-term success of the containment and GW components. GW target levels are based on MCLs or a 10^{-5} risk level, whichever is more stringent for carcinogens; and MCLs, MCLGs, or an HI of 1, whichever is more stringent, for noncarcinogens	$22,209,000 (present worth) $489,000 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Northernaire Plating, MI Former Electroplating Facility 09/29/89 2nd - Final	GW contaminated with VOCs including toluene, TCE, PCE, and xylene; and metals including chromium	Not specified	Two-stage GW pumping and treatment system using carbon adsorption to remove metals and air stripping with vapor phase carbon adsorption to remove VOCs, followed by discharge to SW; GW monitoring; and implementation of site access and GW and land use restrictions	GW will meet or exceed State and SDWA MCL standards. Target GW cleanup levels include xylene 440 ug/l, toluene 40 ug/l, PCE 1 ug/l, TCE 5 ug/l, and chromium 50 ug/l	$16,000,000 (present worth) $5,000,000 (O&M years 1-60)
V	Ott/Story/ Cordova Chemical, MI Industrial Facility 09/29/89 1st	GW and SW contaminated with VOCs including benzene, PCE, TCE, toluene, vinyl chloride, and xylenes; other organics including PCBs and pesticides; and metals including arsenic	Not specified	GW pumping and treatment using UV-oxidation, carbon adsorption, biological treatment (activated sludge), and filtration with discharge to SW; and environmental monitoring	Effluent levels will meet State NPDES levels, which are dependent on final discharge point. ARARs pertaining to GW restoration will be addressed in a subsequent overall GW operable unit	$11,751,000 (present worth) $1,500,000 - $1,600,000 (annual O&M years 1-5)
V	Outboard Marine, IL Marine Products Manufacturing Facility 03/31/89 1st (Amendment)	Soil and sediment contaminated with organics including PCBs	700,000 lbs (soil) 300,000 lbs (sediment)	Construction of containment cell and a new slip; relocation of Larsen Marine; removal, treatment, and onsite disposal of Slip 3 sediment exceeding 500 mg/kg PCB; dredging and disposal of harbor sediment above 50 mg/kg; excavation and onsite treatment of soil and sediment exceeding 10,000 mg/kg PCBs; construction of a west containment cell for treatment residues and lower concentration PCB-contaminated soil; construction of an east containment cell around the parking lot area; construction of a temporary onsite water treatment facility for dredged water; construction of a permanent water treatment facility; onsite treatment of containment cell water followed by discharge to a POTW or an onsite location; capping of all contaminant cells; and GW monitoring	A PCB cleanup goal of 50 mg/kg was established based on site-specific data	$19,000,000 (capital) O&M not specified

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Waite Park Wells, MN Municipal Wells 09/28/89 1st - Final	GW contaminated with VOCs including PCE and TCE	Not specified	Installation of GW extraction wells in the contamination plumes; treatment of extracted GW via packed tower aeration; discharge of treated GW via storm drain to river; and SW and GW monitoring	Chemical-specific GW cleanup goals include PCE 6.6 ug/l (RAL) and TCE 5 ug/l (MCL). SW discharge will comply with CWA AWQS. Chemical-specific GW discharge goals include PCE 8.9 ug/l and TCE 123 ug/l	$913,000 (present worth cost) O&M not specofied
V	Wauconda Sand & Gravel, IL 52-Acre Industrial/ Municipal Commercial/ Residential Landfill 03/31/89 2nd - Final	GW, SW, and air contaminated with VOCs including vinyl chloride and benzene; metals including arsenic and lead; and methane	Not specified	Long-term monitoring of GW, SW, and air emissions with possible evaluation of additional remedial alternatives, if necessary; further upgrade of site cap; installation and operation of improved venting system; continued O&M of leachate collection and venting systems; maintenance of site cap, fence, and monitoring well network; and implementation of institutional controls to restrict GW use	MCLs and State Public and Food Processing standards are considered ARARs for offsite GW quality. If offsite GW exceeds an MCL or a 10^{-5} cumulative cancer-risk level for lifetime drinking water usage (excluding arsenic and vinyl chloride) and background levels, additional investigations will be performed. Leachate collection system will operate until action levels are established and attained. Air emissions will be controlled and treated if incremental risk to nearby residents is $>10^{-6}$ lifetime exposure	$12,155,606 (present worth) $174,500 (annual O&M)
V	Wausau Water Supply, WI Well Field 12/23/88 1st	GW contaminated with VOCs including TCE	Not specified	GW pumping and treatment using air stripping with onsite discharge to SW; and GW monitoring	Remedy addresses plume management not remediation. Effluent levels will satisfy BAT	$750,000 (present worth) $105,000 (annual O&M year 1) $81,000 (annual O&M subsequent years)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Wausau Water Supply, WI Municipal Water Supply Facility 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including TCE and PCE	Not specified	Treatment of soil using an in-situ soil vapor extraction (SVE) system and treatment of gases emitted from the SVE system using vapor phase carbon filters; and continued GW pumping and treatment using existing air strippers with modified pumpage rates	Performance goals for this remedial action are based on State GW standards including PCE 1.0 ug/l and TCE 1.8 ug/l	$738,000 (present worth) $482,000 (present worth O&M)
V	Wedzeb Enterprises, IN Industrial Warehouse Facility 06/30/89 1st - Final	Sewer sediment contaminated with organics including PCBs	Not specified	Hydraulic flushing and vacuum pumping of sewer lines followed by filtering the resulting water and sediment and discharging to POTW; offsite incineration and disposal of sediment and waste drums, if PCB levels are 50 mg/kg or greater or offsite disposal only if PCB levels are below PCB 50 mg/kg; and a television inspection of the pipeline to ensure structural integrity	The cleanup goal of 10 mg/kg for PCBs was established by the TSCA Spill Policy	$45,000 (present worth) $0 (O&M)
V	Whitehall Municipal Wells, MI Municipal Well Fields 09/29/89 1st - Final	None	Not applicable	No further action is being taken because contaminant levels in the site's wells do not exceed any State or Federal drinking water standards or criteria	Not applicable	$0 (present worth)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Windom Dump, MN Former Municipal Landfill 09/29/89 1st - Final	GW contaminated with VOCs including benzene, PCE, and TCE; metals including arsenic; and other inorganics	Not specified	Grading, capping, and revegetating the fill area; modifying the existing municipal waste plant by installing additional aeration nozzles and structure venting; and GW monitoring	The municipal water treatment system will remove VOCs and will ensure that contaminants of concern do not exceed a 10^{-5} lifetime excess cancer risk and SDWA MCLs. GW will be treated if the GW exceeds a single allowable limit. Specific limits are based on State solid waste management rules and include TCE 7.8 ug/l, PCE 1.7 ug/l, benzene 3.0 ug/l, and arsenic 12.5 ug/l	$865,000 (present worth) $5,700 (O&M years 1-30)
VI	Homestake Mining, NM Uranium Processing Mill 09/27/89 1st - Final	None	None	No action remedy. Tailing embankments not found to be significant source of offsite radon	Not applicable	$0 (present worth)
VI	Motco, TX Former Styrene Tar Recycling operation and Former Industrial Chemical Waste Disposal Facility 09/27/89 2nd - Final	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including PAHs; and metals including arsenic, chromium, and lead	140,000 yd^3 (soil and sediment) 30,000,000 - 40,000,000 gals (GW in transmissive zone) 1,000,000 - 2,000,000 gals (dense, nonaqueous phase organic liquids)	GW pumping and onsite treatment using BAT; extraction and incineration of dense, non-aqueous phase organic liquids; installation of GW gradient control system; implementation of GW compliance monitoring of aquifers; excavation, consolidation, and onsite containment of contaminated surface and soil and sediment; and implementation of site access and deed restrictions	GW treatment is expected to meet Federal and State discharge standards; if discharge standards are not met, GW will be sent to a wastewater treatment plant. Cleanup goals for the upper aquifer are SDWA MCLs or a 10^{-6} cancer risk level. Treatment of shallow GW will be to health-based numbers and include PAHs 0.0028 ug/l. Soil/sediment excavation will be determined by a 10^{-6} risk level	$8,810,000 (present worth) $453,000 (annual O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Pesses Chemical, TX Industrial Facility 12/22/88 1st - Final	Soil, sludge, and debris contaminated with metals including lead	16.6 yd^3 (sludge)	Consolidation of offsite contaminated soil with onsite wastes and surface soil followed by in-situ stabilization and installation of a concrete cap over the fenced portion of the site and a RCRA-clay cap placed in the south field; decontamination of warehouse with resultant solid wastes combined with soil remediation and wastes treated and discharged into sewer system; offsite disposal of drums and equipment not adequately cleaned; offsite disposal of water not meeting discharge requirements; and cleaning and sealing sumps	Soil will be treated to attain cadmium 15 mg/kg and nickel 100 mg/kg based on a 10^{-6} carcinogenic risk level	$1,200,000 (present worth) $7,000 (annual O&M)
VI	Sheridan Disposal Services, TX Commercial Waste Disposal Facility 12/29/88 1st	Soil and sludge contaminated with VOCs including benzene and toluene; and other organics including PCBs	13,000 yd^3 (soil) 31,000 yd^3 (sludge) 300 yd^3 (floating oil and emulsion)	Excavation of all material with PCB concentrations >25 mg/kg including soil, sludge, floating oil, and emulsion in the pond and storage tanks. This will be followed by onsite biotreatment of contaminated soil, sludge, and oil with stabilization and onsite disposal of residues in the pond. If PCB concentrations in the residues are <50mg/kg, they will be placed under a RCRA-compliant cap. Residues containing >50 mg/kg PCB will be placed in a RCRA-compliant landfill in the pond area; capping entire pond and dike area; decontamination and offsite disposal of tanks, drums, and debris; treatment to BAT of any contaminated wastewater and storm water with discharge to the river; GW monitoring; and implementation of institutional and engineering controls	An action level for PCBs was established at 25 mg/kg based on a health-risk analysis and TSCA Spill Policy. Waste residues will be disposed of according to PCB levels	$27,956,000 (present worth) $863,0000 (O&M)
VI	Sheridan Disposal Services, TX Former Hazardous and Solid Waste Disposal Facility 09/27/89 2nd	GW contaminated with VOCs including benzene, PCE, and TCE; and metals including arsenic	Not specified	Natural attenuation with GW and SW monitoring; implementation of GW use restrictions; and implementation of corrective action plan if ACLs are exceeded in the future	EPA has set ACLs for GW contaminants in order to meet drinking water criteria in SW. Chemical-specific ACL concentrations include benzene 26 mg/l, TCE 26 mg/l, PCE 41 mg/l, and arsenic 260 mg/l	$0 (present worth) $194,000 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	South Valley, NM Industrial Facilities Area 03/30/89 5th - Final	No significant contamination was identified for this source control remedial action	Not applicable	No further action	Not applicable	$0 (present worth)
VI	United Creosoting, TX 100-Acre Former Wood Preserving Facility 09/29/89 2nd - Final	Soil contaminated with organics including PAHs, PCPs, and dioxins	94,000 yd^3 (soil)	Excavating and treating soil using critical fluid extraction and recycling or discharging wastewater generated during treatment process; incinerating and disposing of liquid organic concentrate residues offsite; spreading treated soil on commercial portion of the site; backfilling residential areas with clean fill; and air monitoring	Contaminated soil will be excavated and treated if soil exceeds target action levels. Specific target action levels for carcinogens in the soil include PAHs 330 ug/kg for the residential area, and PAHs 40,000 ug/kg for the commercial area of the site. Target action levels for dioxins and furans are based on 2,3,7,8-TCDD 1 ug/kg for the residential area and 2,3,7,8-TCDD 20 ug/kg for the commercial area. Specific target action levels for noncarcinogens include PAHs 2,000 mg/kg and PCP 150 mg/kg	$22,000,000 (present worth) $19,750,000 (present worth O&M years 1-30)
VII	Arkansas City Dump, KS Former Oil Refinery 09/19/89 2nd - Final	None	Not applicable	No action remedy. EPA has determined that it lacks authority or jurisdiction to undertake cleanup of onsite petroleum wastes that are not being released in significant concentrations	Not applicable	$0 (present worth) $0 (O&M)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Chemplex, IA Manufacturing Facility 09/27/89 1st	GW contaminated with VOCs including benzene, toluene, xylene, TCE, and PCE; and other organics including carcinogenic and noncarcinogenic PAHs	Not specified	GW pumping and pretreatment followed by treatment of pretreated GW at the existing onsite biological activated sludge wastewater treatment plant with discharge to SW; implementation of GW use and deed restrictions	GW cleanup goals were derived from Health Advisory Levels (HALs), Negligible Risk Levels (NRLs), Water Quality Criteria (WQC), and MCLs. Specific goals include benzene 1.0 ug/l (NRL), toluene 2,000 ug/l (HAL), PCE 10 ug/l (HAL), TCE 3.0 ug/l (NRL), and xylene 10,000 ug/l (MCL)	$2,622,000 (present worth) $219,600 (annual O&M years 1-30)
VII	Cherokee County, KS Mining District 09/18/89 2nd	GW and SW contaminated with metals including cadmium, chromium, lead, and zinc	Not specified	Removal, consolidation, and onsite placement of surface mine wastes in mine pits, shafts, and subsidences; diversion and channelization of surface streams with recontouring and vegetation of land surface; investigation of deep aquifer well quality followed by plugging all abandoned and inactive wells and rehabilitating active wells, if necessary; and implementation of institutional controls including deed restrictions	The selected remedy provides action levels for the removal and placement of mine wastes below ground. Chemical-specific action levels include lead, 1,000 mg/kg, zinc 10,000 mg/kg, and cadmium 25 mg/kg	$8,295,215 (present worth) $14,963 (annual O&M)
VII	Doepke Disposal (Holliday), KS Industrial Waste Landfill 09/21/89 1st - Final	Soil and GW contaminated with VOCs including benzene, xylene, and toluene; other organics including pesticides, PAHs, and PCBs; and metals including chromium and lead	96,000 gals (leachate)	Removal and offsite treatment of contaminated liquids currently ponded underground; construction of a multi-layered cap; collection and offsite treatment of GW seepage at POTW, as necessary; GW monitoring; and implementation of deed and access restrictions	No cleanup criteria were established for soil because soil will be capped. GW cleanup standards were established for four metals and five organic pesticides. Chemical-specific GW cleanup goals were not specified	$5,970,000 (present worth) $107,000 (annual O&M)
VII	Findett, MO Chemical Plant 12/28/88 1st	Soil and GW contaminated with VOCs and other organics including PCBs	Not specified	Soil excavation with either offsite disposal or treatment; and GW pumping and treatment using air stripping with discharge to POTW	Not specified	$1,100,000 (capital)

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Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Hastings Ground Water Contamination, NE Multiple Source GW Contamination 09/26/89 1st	Soil contaminated with VOCs including carbon tetrachloride and chloroform	400 lbs (VOCs in soil)	Treating soil using in-situ soil vapor extraction to remove VOCs from soil; treating vapor emissions by a vapor phase granular activated carbon system; and replacement of carbon filters followed by offsite disposal at an approved regeneration or incineration facility	No cleanup levels were established because this interim source control action is not designed to restore aquifer to drinking water standards. Cleanup effectiveness will be based on the volume of volatile contaminants recovered from soil	$874,000 (capital) $154,000 (annual O&M)
VII	Johns' Sludge Pond, KS Waste Oil Disposal Area 09/22/89 1st - Final	None	Not applicable	No further action will be taken at this site because previous interim remedial activities were adequate. Post-closure maintenance and monitoring will be provided in addition to implementation of land use controls	Not applicable	$0 (present worth) $0 (O&M)
VII	Kem-Pest Laboratories, MO Pesticide Manufacturing Facility 09/29/89 1st	Soil and sediment contaminated with VOCs including xylenes; other organics including organochlorine and pesticides; and metals including arsenic	4,050 yd^3 (soil and sediment)	Excavation of soil and sediment with offsite disposal in a RCRA-approved landfill; sampling to verify extent of excavation is sufficient to meet cleanup goals; and backfilling and revegetating excavated area with clean soil	Soil and sediment will be excavated to a level consistent with a 10^{-5} excess cancer risk	$2,600,000 (present worth)
VII	Solid State Circuits, MO Manufacturing Facility 09/27/89 1st - Final	GW contaminated with VOCs including TCE	57,790,000 gals (GW)	GW pumping and treatment using air stripping with offsite discharge to a POTW; and GW and air monitoring	GW exceeding TCE 5 ug/l will be remediated at a POTW. GW with TCE levels above 200 ug/l will be treated onsite before discharge to the POTW. Discharge from the POTW must meet the average monthly State NPDES limits of TCE 2 ug/l. GW cleanup goals will meet a 10^{-6} cancer risk and an HI ratio <1	$4,629,000 (present worth) $445,300 (annual O&M)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Todtz, Lawrence Farm, IA 2.7-Acre Landfill 11/04/88 1st - Final	GW contaminated with VOCs including benzene, toluene, carbon disulfide, and tetrahydrofuran; and metals including arsenic, lead, and chromium	Not specified	Installation of soil cover over impoundment; provision of an alternate water supply to affected residence; GW monitoring; and implementation of institutional controls and land use restrictions	Not applicable unless chemical-specific action levels (based on MCLs) are exceeded in GW monitoring wells	$1,030,000 - $2,500,000 (present worth) $510,000 (present worth O&M)
VII	Vogel Paint & Wax, IA 2-Acre Disposal Area 09/20/89 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes; and metals including chromium and lead	3,000 yd^3 (soil)	Excavation and onsite bioremediation of contaminated soil or onsite thermal treatment if metal content is high; stabilization and onsite disposal of treated soil; offsite incineration, recycling of leachate and offsite treatment of excess leachate at POTW; GW pumping and treatment using air stripping with discharge of treated GW to SW; and GW and air monitoring	Soil treatment will achieve leaching standards and GW will be treated to health-based levels. GW cleanup goals are based on SDWA MCLs/MCLGs or on State action levels. Specific GW cleanup goals include benzene 0.001 mg/l (State), toluene 2.0 mg/l (MCLG), xylenes 10.0 mg/l (MGLG), chromium 0.10 mg/l (MCL), and lead 0.005 mg/l (MCLG)	$1,851,000 (present worth) $54,600 (annual O&M)
VIII	Burlington Northern (Somers Plant), MT Former Railroad Tie Treating Facility 09/27/89 1st - Final	Soil, sediment, and GW contaminated with organics including PAHs and phenols, and metals including zinc	11,700 yd^3 (soil and sediment)	Excavation of soil and sediment with onsite biological treatment; restoration of wetlands; installation and operation of hot water flushing system and a water treatment system using ozone/UV or peroxide/UV in lagoon and swamp pond areas to treat GW, with in-situ biological treatment to treat residual contaminants; reinjection or discharge of GW to POTW; GW monitoring; and implementation of GW use restrictions	Soil will be treated until the decrease in total PAHs has been <20% per year or background levels have been reached. Soil treatment goal is a risk level of 10^{-6}. GW cleanup goals include cPAHs 0.030 ug/l (WQC), total PAHs 0.30 ug/l (10^{-5} risk-based level), phenol 2,500 ug/l (WQC), benzene 5 ug/l (MCL), and zinc 110 ug/l (WQC)	$11,000,000 (present worth) $661,000 (O&M years 1-2) $811,000 (O&M years 3-10) $72,000 (O&M years 11-30)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	Libby Ground Water Contamination, MT Well Field 12/30/88 2nd	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including dioxin, PAHs, and PCPs; metals including arsenic; and oil	30,000 yd^3 (soil)	Remedial actions are based on three operable units: Soil/source area - excavation and consolidation of unsaturated soil and debris in the waste disposal pit, followed by onsite treatment using a two-step enhanced biodegradation process and final disposition; cleaning saturated soil beneath the waste disposal pit using a closed-loop, water/oil recovery and treatment system; removal of oil and contaminated GW using extraction wells; reinjection of water following treatment in a fixed-bed bioreactor, filling and capping of waste pit, butt dip, and tank farm areas Upper aquifer - in-situ GW bioremediation Lower aquifer - implementation of pilot tests using biorestoration, and oil recovery and dispersion techniques. All three operable units will be subject to institutional controls including deed, land use, and GW restrictions; and GW monitoring	Treatment of soil and debris will attain total cPAHs 88 mg/kg based on 10^{-5} risk level (chemical-specific goals were provided for many PAHs based on BDAT concentrations), PCP 37.0 mg/kg (BDAT), and combined dioxins and dibenzofurans 0.001 mg/kg. Saturated zone and upper aquifer GW treatment will attain total cPAHs 400 ng/l total noncarcinogenic PAHs 40 ng/l; PCP 1.05 mg/l, benzene 5 ug/l (MCL), and arsenic 50 ug/l (MCL). Other organics/ inorganics are not to exceed a 10^{-5} risk level	$5,777,000 (present worth) $670,200 (annual O&M year 2) $521,200 (annual O&M years 3-5) $232,200 (annual O&M years 6-8) $80,000 (annual O&M years 9-30)
VIII	Monticello Vicinity Properties, UT Uranium Millsite 09/29/89 1st - Final	Soil, construction materials, and debris contaminated with thorium$_{230}$, radium$_{226}$, and radon ^{222} contained in the vanadium and uranium mill tailings	100,000 yd^3 (soil and construction materials)	Excavation and removal of residual radioactive material from affected properties and restoration/reconstruction using clean materials, or modification of existing structures to isolate radiation sources; filling and regrading excavated areas; and disposal and temporary storage of contaminated material at the Monticello Millsite	Cleanup goals are based on the Uranium Mill Tailings Radiation Control Act of 1978. Individual goals include radium ^{226} in land averaged over 100 m^2 shall not exceed 2pCi/g (background level) by 5pCi/g averaged over the first 15 cm of soil or 15 pCi/g averaged over 15 cm thick layers more than 15 cm below the surface. Additionally, habitable buildings $\leq$0.02 WL for annual average radon decay and gamma radiation 20 microentgens per hour	$5,915,000 (average cost) Corresponds to $65,000 per property multiplied by 91 properties

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	Sand Creek Industrial, CO Former Pesticide Manufacturing Operation 09/29/89 1st	Soil, onsite buildings, and tanks contaminated with VOCs including TCE and PCE; and other organics including pesticides	1,000 yd^3 (soil)	In-situ vacuum extraction to remove VOCs from contaminated soil and onsite treatment of off-gas by air stripping; excavation and offsite incineration of soil contaminated with >1,000 mg/kg HOCs, with offsite residual disposal in a RCRA landfill; backfilling; demolition and offsite disposal of buildings; and GW monitoring	Soil target levels were calculated using a soil-water leaching model that assumed GW concentration correspopding to SDWA MCLs or a 10^{-6} cancer risk level. Chemical-specific cleanup levels were provided for PCE 1,095 ug/kg (MCLs) and TCE 285 ug/kg (MCLs)	$5,349,600 (present worth) O&M not specified
VIII	Woodbury Chemical, CO Waste Disposal Area 09/29/89 2nd - Final	Soil contaminated with VOCs including PCE and TCE; other organics including pesticides; and metals including arsenic	12,370 yd^3 (soil)	Excavation and offsite incineration of highly contaminated soil followed by offsite disposal; excavation and offsite disposal of less contaminated soil at a RCRA-permitted landfill; and backfilling and revegetation of the excavated area	Soil cleanup will attain an excess lifetime cancer risk of 10^{-6}. Specific cleanup goals are based on ARARs and background levels and include arsenic 5-10 mg/kg, TCE 0.52 mg/kg, and PCE 1.9 mg/kg	$6,962,600 (present worth) $31,400 (O&M)
IX	Atlas Asbestos Mine, CA Asbestos Handling and Shipment Area 07/19/89 1st	Soil and debris contaminated with metals including nickel; and other inorganics including asbestos and mining wastes	14,500 yd^3 (soil)	Excavating and consolidating asbestos- and nickel-contaminated soil and debris; constructing onsite underground waste management unit (WMU) and disposing of contaminated soil in WMU; capping WMU area; regrading excavated area; decontaminating debris; monitoring soil moisture content, GW, air, and personnel; and implementing institutional controls	All contaminated soil and mining wastes will be cleaned up to at or below one area percent asbestos using polarized light microscopy and at or below background levels for nickel	$1,500,000 - $2,500,000 (present worth) $35,000 (annual O&M)
IX	Beckman Instruments (Porterville), CA 12-Acre Manufacturing Facility 09/26/89 1st - Final	Soil and GW contaminated VOCs including TCE and metals including lead	740 yd^3 (soil)	Excavation and offsite disposal of lead-contaminated soil; continued operation th GW pumping and treatment system for the upper aquifer; pumping and treatment of GW from upper aquitard and lower aquifer using air stripping; offsite discharge of all treated GW into infiltration basins or irrigation canals; and GW monitoring	Soil contaminated with lead above 200 mg/kg will be excavated and disposed of offsite. GW cleanup goals will attain State or Federal MCLs or State action levels. Chemical-specific GW cleanup goals include TCE 5 ug/l	$4,740,000 (present worth) $O&M not specified

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Coalinga Asbestos Mine, CA Asbestos Handling and Shipment Area 07/19/89 1st	Soil and debris contaminated with metals including nickel; and other inorganics including asbestos and mining wastes	14,500 yd^3 (soil)	Excavating and consolidating asbestos- and nickel-contaminated soil and debris; constructing onsite underground waste management unit (WMU) and disposing of contaminated soil in WMU; capping WMU area; regrading excavated area; decontaminating debris; monitoring soil moisture content, GW, air, and personnel; and implementing institutional controls	All contaminated soil and mining wastes will be cleaned up to at or below one area percent asbestos using polarized light microscopy	$1,500,000 - $2,500,000 (present worth) $35,000 (annual O&M)
IX	Coast Wood Preserving, CA					
IX	Fairchild Semiconductor (Mt. View), CA Industrial Facilities Area 06/09/89 - 06/30/89 1st and 2nd - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenols	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited excavation and aeration of soil outside the slurry walls with onsite disposal of residues; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	$49,000,000 - $56,000,000 (present worth, which includes O&M cost)
IX	Fairchild Semiconductor (S. San Jose), CA Manufacturing Facility 03/20/89 1st - Final	Soil and GW contaminated with VOCs including PCE, TCA, DCE, and xylenes	Not specified	Onsite soil vapor extraction; on- and offsite pumping and treatment of shallow GW using air stripping followed by discharge to SW; deep GW pumping followed by discharge of untreated GW to SW via storm drains; conducting biodegradation studies of onsite chemicals; implementing institutional controls including deed restriction and land and GW use restrictions; and GW monitoring	The soil cleanup goal is 1 mg/kg for VOCs. Individual cleanup goals for onsite GW include DCE 6 ug/l; TCA 200 ug/l, and xylenes 620 ug/l (based on DHS drinking water action levels), and PCE 2 ug/l (proposed State MCL). Offsite GW will attain an HI of 0.25	$9,393,100 (present worth) $7,231,700 (total O&M)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Firestone Tire (Salinas Plant), CA 256-Acre Tire Manufacturing Plant 09/13/89 1st-Final	GW contaminated with VOCs including TCE, PCE, benzene, toluene, xylenes, 1,1-DCA, 1,1-DCE, and 1,1,1-TCA	Not specified	GW pumping and treatment at the existing treatment facility using carbon adsorption and air stripping, with offsite discharge of treated GW to SW; GW monitoring to ensure that the GW plume is declining; crop testing to ensure that there is no plant uptake of the contaminants; and developing a contingency plan for water in the deep aquifer in case of contamination	GW cleanup goals will be based on chemical-specific ARARs, a cumulative HI=1 for noncarcinogens, or a carcinogenic risk of 10^{-6} depending on which is more stringent. Chemical-specific goals include benzene 0,7 ug/l (State), TCE 3.2 ug/l (10^{-6} risk level), PCE 0.7 ug/l (10^{-6} risk level), toluene 20 ug/l (HI=1), xylenes 70 ug/l (HI=1), 1,1-DCA 5.0 ug/l (State), and 1,1-DCE 6.0 ug/l (HI=1)	$1,742,000 (present worth) $1,517,000 (O&M for years 1-3.5)
IX	IBM (San Jose Plant), CA Industrial Facility 12/15/88 1st - Final	Soil and GW contaminated with VOCs including TCA, toluene, and xylenes; and other organics	Not specified	Onsite soil vapor extraction; GW pumping and treatment using air stripping with onsite discharge to the aquifer and offsite discharge to SW, if necessary	Soil remediation will attain a 1 mg/kg level for all contaminants of concern. GW remediation goals are based on State action levels, EPA reference doses and lifetime health advisories and include TCA 200 ug/l (State), toluene 100 ug/l (State), and xylenes 200 ug/l (State) in the upper zone, and an HI of 0.25 with TCA 50 ug/l in the deeper aquifer zones	Not specified

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Intel (Mountain View Plant), CA Industrial Facilities Area 06/09/89 1st - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenols	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited soil excavation and aeration outside the slurry walls with onsite disposal of residues; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	$49,000,000 - $56,000,000 (present worth)
IX	Koppers (Oroville Plant), CA Wood Treating Facility 09/13/89 1st - Final	Soil and GW contaminated with VOCs including toluene, xylenes, and benzene; other organics including PAHs, PCP, and dioxins/furans; and metals including arsenic and chromium	334,000 yd^3 (soil) 22,000,000 yd^3 (GW)	Remediation of four discrete soil areas includes in-situ biodegradation; excavation, soil washing, with onsite disposal of treated soil and treatment of residual contamination in the washing fluid of onsite treatment facility; installation of a low permeability cap accompanied by downgradient extraction wells; and excavation and chemical fixation of metal-contaminated soil followed by onsite disposal. GW remediation includes pumping and treatment using activated carbon with reinjection to GW; and formalization and expansion of existing alternate water supply	Soil cleanup goals include PCP 17 mg/kg, dioxins/furans 0.03 ug/kg, background for arsenic and chromium, and cPAHs 0.19 mg/kg. These levels will achieve 10^{-6} excess cancer risk targets. GW objectives are the more stringent of 10^{-6} excess cancer risk or State action levels and include PCP 2.2 ug/l, cPAHs 0.007 ug/l, dioxins 0.00000053 ug/l or the lowest detection limit, and background for arsenic and chromium	$77,700,000 (present worth) $37,100,000 (present worth O&M)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Litchfield Air-port Area, AZ Industrial Facilities 09/26/89 2nd - Final	Soil and GW contaminated with VOCs including TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead	284,100 yd^2 (soil)	The selected remedial action for the northern portion of the site includes treatment of soil using SVE to remove 99% of contaminants; and GW pumping and treatment using air stripping, liquid phase GAC and GAC polishing on air emissions, followed by reinjection or discharge of municipal water system. Remedial activities for the southern porition of the site include treatment of VOC-contaminated soil using SVE; and GW pumping and treatment using air stripping and wellhead treatment followed by discharge to municipal water system	VOC and metal-contaminated soil will be removed until levels remaining will not cause or contribute to GW contamination in concentrations exceeding GW cleanup standards. GW cleanup goals are based on SDWA MCLs, SALs, and AWQC. Chemical specific GW cleanup goals include toluene 340 ug/l (SAL), TCE 5 ug/l (MCL), xylenes 44 ug/l (SAL), arsenic 50 ug/l (MCL), chromium 50 ug/l (MCL), and lead 50 ug/l (MCL)	$30,227,000 - $31,693,000 (present worth) O&M (to be determined)
IX	Nineteenth Avenue Landfill, AZ 213-Acre Municipal and Industrial Landfill 09/29/89 1st-Final	Soil and refuse contaminated with VOCs including toluene and xylenes	Not specified	Containing landfill wastes onsite by constructing an impermeable cap and surface drainage structure over the landfill and soil-cement levees along the river at the landfill boundary; widening the river channel; collecting and flaring landfill generated gases; implementing institutional controls and access restrictions; air and GW monitoring; and implementing a contingency GW treatment plan whenever GW standards are exceeded at the landfill boundary	Not applicable to landfill wastes. GW currently does not pose a threat to human health or the environment. If GW monitoring detects concentrations exceeding SDWA MCLs at the landfill boundary, a contingency plan will be implemented	$42,990,000 (present worth) $1,010,000 (annual O&M for years 1-30)
IX	Purity Oil Sales, CA Used Oil Recycling Facility 09/26/89 1st	Sludge and GW contaminated with VOCs including benzene, TCE, toluene, and xylenes; and metals including lead. Sludge also contaminated with other organics including PCBs, PAHs pesticides, and phenols	22,500 gals (sludge)	GW pumping and onsite treatment by greensand to remove metals and air stripping to remove VOCs; disposal of treated GW by either reinjection, disposal in a canal, or disposal in local infiltration basins; provision of alternate water supply; creation of GW management zone; GW monitoring; removal, onsite solidification (if necessary), and offsite disposal of contaminant sludge; and cleaning, dismantling, and offsite disposal of tanks containing sludge	GW treatment will meet Federal and State MCLs and State action levels (SALs), chemical-specific cleanup goals include TCE 5 ug/l (MCL) and benzene 1 ug/l (SAL)	$11,660,000 (present worth) $6,960,000 (present worth O&M)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Raytheon, CA Industrial Facilities Area 06/09/89 1st - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenols	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited excavation and aeration of soil outside the slurry walls with onsite disposal of residuals; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	$49,000,000 - $56,000,000 (present worth)
IX	Sacramento Army Depot, CA Waste Disposal Area 09/29/89 1st	GW contaminated with VOCs including PCE and TCE	Not specified	GW pumping and treatment using ultraviolet light/chemical oxidation followed by discharge to the regional treatment plant and industrial reuse of treated GW	GW will be restored to meet current drinking water standards for TCE 5 ug/l (MCL) and PCE 4 ug/l (State action level)	$1,764,000 (capital) $264,000 (annual O&M)
IX	San Fernando Valley (Area 1), CA Municipal Well Field 06/30/89 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	Pumping and treatment of GW exceeding TCE 100 ug/l or PCE 5 ug/l using air stripping with vapor phase GAC adsorption units or stream stripping, followed by discharge to the municipal water supply distribution system; and GW monitoring	Treated GW will meet Federal MCLs or State action levels. Individual goals include TCE 5.0 ug/l (MCL) and PCE 4.0 ug/l (State)	$69,000,000 (present worth) $43,900,000 (annual O&M years 1-20)

FY89 Record of Decision Summary Table

Region	Site Name, State/Type Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	South Bay Asbestos Area, CA Asbestos Cement Pipe Manufacturing Facility 09/29/89 2nd - Final	Soil, debris, and air contaminated with asbestos	128,500 yd^2 (paved area)	Paving asbestos-contaminated truck yard and industrial yard; controlling dust emissions through monthly wet sweeping of streets; offsite disposal of asbestos-contaminated waste debris; and implementation of deed restrictions and institutional controls	Areas which receive or have potential to receive heavy vehicular traffic will be paved if asbestos levels exceed one area percent by polarized light microscopy	$7,561,000 (present worth) $134,900 (O&M years 1-30)
X	Commencement Bay Near Shore/ Tide Flats, WA Commercial Seaport 09/30/89 2nd	Sediment contaminated with organics including PCBs and PAHs; and metals including arsenic, mercury, lead, and zinc	1,181,000 yd^3 (sediment)	Identification and control of sources contaminating marine environment at the site; sediment remediation includes a combination of natural recovery and four sediment control technologies such as in-situ capping, confined aquatic disposal, confined near-shore disposal, or removal and upland disposal; sediment monitoring; and implementation of site use restrictions	Cleanup goals for sediment were established using the apparent effects thresholds (AET). Specific sediment objectives include PCBs 150 ug/kg, PAHs 17,000 ug/kg, arsenic 57 mg/kg, and lead 450 mg/kg	$32,300,000 (total cost; includes sediment remediation only)
X	Northside Landfill, WA 345-Acre Industrial/ Municipal Landfill 09/30/89 1st - Final	GW contaminated with VOCs including PCE, TCA, and TCE; and metals including iron and lead	Not specified	Landfill closure and capping; GW pumping and treatment during closure with offsite discharge to SW; GW monitoring; provision of an alternate water supply; implementation of institutional controls; and controlling gas emissions	Chemical-specific goals for GW are based on MCLs or AWQC, whichever is more stringent, and include TCA 200 ug/l (MCL) and TCE 5 ug/l (MCL)	$30,000,000 (present worth)
X	Northwest Transformer, WA 1.6-Acre Former Salvage Yard 09/15/89 1st - Final	Soil contaminated with organics including PCBs	1,200 yd^3 (soil)	Excavation, consolidation, and treatment of soil with a PCB concentration >10 mg/kg using in-situ vitrification; filling entire site; abandonment of onsite well; GW monitoring; and sampling of onsite wooden structure to determine whether a second OU is necessary	Soil will be treated until the PCB concentration in the residue is <1 mg/kg	$771,000 (present worth) $0 (O&M)

SECTION IV

RECORDS OF DECISION SUMMARY TABLE

FY 1982-1988

The FY 1982-1988 Record of Decision Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed between FY 1982-1988. The table is presented by Region, in alphabetical order according to the site name.

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FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Auburn Road, NH 09/17/86 1st	GW contaminated with VOCs including TCE, organics, and inorganics	Not specified	Extension of existing municipal water supply	Not specified	$2,372,000 (present worth) $57,000 (annual O&M)
I	Baird and McGuire, MA 09/30/86 1st	GW, soil, and sediments contaminated with VOCs, organics, pesticides, dioxin, PAHs, and metals	191,000 yd^3	Excavation and onsite thermal destruction of contaminated soils; GW pump and treatment with onsite discharge to the aquifer; restoration of wetlands; and relocation of river	Excavation will remove approximately 95 percent of contamination by mass. Action levels for GW remediation will be developed during design	$44,386,000 (capital) $4,132,000 (present worth O&M)
I	Beacon Heights, CT 09/23/85 1st-Final	GW, SW, and soil contaminated with VOCs and organics	Not specified	Excavation of contaminated soils with onsite consolidation; RCRA capping of consolidated wastes, gas venting and stormwater management; leachate collection with offsite disposal at a licensed waste water treatment facility or onsite treatment with discharge to Hockanum Brook; extension of public water supply to the next municipal supply; fencing; and installation of a more extensive GW monitoring system	Excavation of soil to background levels, which will be developed during design	$17,397,000 (capital) $235,000 (annual O&M)
I	Cannon Engineering/ Plymouth, MA 09/30/85 1st	GW, SW, soil, and sediments contaminated with PAHs, pesticides, and metals including lead	Not specified	Removal and offsite disposal of tanks, associated pipework, and foundation to a RCRA approved facility	Not specified	$350,000 or $433,000 (capital) $0 (O&M)
I	Cannon Engineering Corporation, MA Industrial Facility 03/31/88 1st-Final	Soil, GW, and debris contaminated with VOCs including benzene, PCE and TCE, and organics including PAHs and PCBs	Not specified	Excavation and onsite treatment of soil contaminated with VOCs using thermal aeration, and excavation and offsite treatment of soil contaminated with PCBs; implementation of a wetland restoration program; decontamination and removal of buildings, tanks, and structures; additional soil sampling; access restrictions; GW monitoring with implementation of a water quality monitoring program; and institutional controls	Soil cleanup levels were based on leaching potential into GW as determined using the Organic Leaching Model and include benzene 550 ug/kg and TCE 71 ug/kg. The soil cleanup level for PCBs 9 mg/kg is based on risk levels. GW cleanup levels are the MCLs for benzene 5 ug/l, TCE 5 ug/l, and vinyl chloride 2 ug/l	$3,411,000 - 4,505,000 (present worth) $700,000 (present worth O&M)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Charles George, MA 12/29/83 1st	GW contaminated with VOCs	Not specified	Extension of existing water supply system	Not specified	$2,453,000 (present worth)
I	Charles George, MA 07/11/85 2nd	Air, GW, SW, and sludge contaminated with VOCs including toluene, organics, and metals	Not specified	Capping; SW diversion and collection system; venting off-gas collection system to the atmosphere; and a full peripheral leachate collection system	Not specified	$13,613,725 (capital) $1,252,901 (annual O&M)
I	Charles George Reclamation Landfill, MA 70-Acre Landfill 09/29/88 3rd and 4th Final	Sediments, GW, and air contaminated with VOCs including benzene, TCE, and PCE, organics including PAHs, and metals including arsenic	500 yd^3	GW pump and treatment along with collected leachate using biological treatment, metals precipitation, and carbon adsorption, followed by onsite discharge to GW; GW and residential well monitoring; collection and incineration of landfill vent gas emissions; excavation and solidification of sediments with onsite disposal in landfill	GW cleanup will meet individual target levels based on MCLs including benzene 5 ug/l, arsenic 50 ug/l, and TCE 5 ug/l. Discharge concentration levels were provided for 18 contaminants. Sediments will meet the target cleanup level for PAHs of 1.0 mg/kg based on a risk level of $4x10^{-6}$. Vent emissions will be treated to a cumulative risk level of $1x10^{-6}$. Individual target levels for vent emissions were provided for 12 contaminants including benzene 568 ug/m^3, TCE 3,210 ug/m^3, and PCE 8,690 ug/m^3	$11,320,000 (present worth) $773,000 (annual O&M)
I	Davis Liquid Waste, RI 09/29/87 1st	Soil and GW contaminated with VOCs, inorganics, and organics	25,000 yd^3	Excavation and onsite incineration of raw wastes and contaminated soils with backfilling of treated soils not EP toxic; onsite disposal of EP toxic treated soils in RCRA landfill; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply for nearby residences	Soils will be treated to attain 10^{-5} cancer risk level with concentrations of total VOCs reduced to <2 mg/kg. GW will be treated to attain the 10^{-5} cancer risk level which includes reducing concentrations of benzene and TCE to 5.0 ug/l (MCLs) each	$27,392,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Groveland Wells, MA Industrial Facility 09/30/88 1st	Soil, sediments, GW, and SW contaminated with VOCs including PCE and TCE, and metals including arsenic and lead	20,000 yd^3 (soil)	In situ vacuum extraction followed by carbon adsorption treatment of contaminated soil; GW pump and treatment using air stripping and carbon adsorption with reinjection to the aquifer; GW monitoring; and sealing or disconnecting all drains and lines to the subsurface disposal system	GW cleanup levels for VOCs are based on MCLs or a 10^{-6} cancer risk level, and cleanup levels for metals are based on State Ground Water Quality Standards and permit requirements. Individual goals include PCE 5.0 ug/l, TCE 5.0 ug/l (MCL), arsenic 50 ug/l, and lead 50 ug/l. Soil cleanup goals for VOCs were based on achieving the target GW levels and include PCE 18.2 ug/kg and TCE 6.3 ug/kg	$4,165,000 (present worth) $2,677,000 (present worth O&M)
I	Hocomonco Pond, MA 09/30/85 1st-Final	GW, SW, soil, and sediments contaminated with organics, inorganics, and metals	Not specified	Former Lagoon: capping with site grading; and relocation of storm drain pipe Kettle Pond Area: pond dewatering and lowering area ground water levels; soil and waste excavation; dewatering sediments with onsite landfilling; air quality monitoring; if necessary, treatment with discharge of effluent water; construction of onsite landfill; and restoration of wetland areas Hocomonco Pond and Discharge Stream: mechanical dredging and onsite disposal of sediments; and treatment of pond water in system constructed for Kettle Pond area Otis Street: seal storm drain Isolated Areas: removal of contaminated materials and onsite disposal	Not specified	$2,213,000 (capital) $56,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Industri-plex, MA 09/30/86 1st	GW, soil, sludge, and air contaminated with metals, and VOCs including toluene and benzene	1,000 yd^3	Capping with soil grading; GW pump and treatment using air stripping with discharge to the aquifer; development of a multi-service GW response plan; institutional controls; stabilization of side slopes; and treatment of gaseous emissions	Eliminate direct contact threat of soils with arsenic >300 mg/kg, lead >600 mg/kg and chromium >1000 mg/kg. GW treatment will meet MCLs. Air remedy will achieve NAAQS and unit cancer risks	$12,302,300 or $12,612,000 (depending on air treatment) (present worth) $285,500 or $311,000 (depending on air treatment) (annual O&M)
I	Iron Horse Park, MA Industrial Facility 09/15/88 1st	Soil, sludge, and debris contaminated with VOCs, organics including PAHs, and metals including arsenic and lead	28,000 yd^3 (soil and sludge)	Excavation and biodegradation of contaminated soil and sludge with residual disposal to the lagoon area, followed by constructing a clean soil cover and revegetation; and decontamination of the lagoon system's piping and pumps	Treatment of soil and sludge will attain a 10^{-6} excess cancer risk for industrial use of the area, and 10^{-5} excess cancer risk for residential use of the area. Treatment should reduce contaminant concentration in wastes 70–80%, and will meet the state pathogen reduction requirements for sludge. Individual cleanup goals were not specified	$2,273,000 (capital) $47,000 (present worth O&M)
I	Keefe Environmental, NH 11/15/83 1st	SW and soil contaminated with VOCs including TCE and PCE, organics, and metals	Not specified	Removal and offsite disposal of lagoon contents, liner, and highly contaminated soil	Not specified	$500,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Keefe Environmental Services, NH Waste Disposal Facility 03/21/88 2nd-Final	Soil and GW contaminated with VOCs including PCE and TCE	150,000 ft^2 (soil area)	In situ treatment of soil using vacuum extraction with discharge to the atmosphere; and GW pump and treatment using air stripping, filtration, and carbon adsorption with discharge to a GW recharge area along site border (adjacent to wetland)	Cumulative soil cleanup goals will attain a 5.7 x 10^{-5} cancer risk level. Individual goals include benzene 20.8 ug/kg, PCE 91 ug/kg, TCE 31.5 ug/kg, 1,2-dichloroethane 3.5 ug/kg, and 1,1-dichloroethylene 22.8 ug/kg. GW will meet MCL values which include benzene 5 ug/l, PCE 5 ug/l, TCE 5 ug/l, 1,2-dichloroethane 5 ug/l, and 1,1-dichloroethylene 7 ug/l	$1,937,300 (capital) $4,157,700 (present worth O&M)
I	Kellogg-Deering Well Field, CT 09/25/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	Initiation of existing air stripping facilities with discharge to existing treatment plant and distribution system	GW treatment will achieve a 99 percent TCE removal efficiency, which corresponds to the 10^{-6} excess cancer risk	$69,751 (capital) $0 (O&M)
I	Landfill and Resource Recovery, RI 28-Acre Industrial/Municipal Landfill 09/29/88 1st-Final	Air contaminated with VOCs including benzene, toluene, PCE, and TCE	Not specified	Upgrading the landfill by slope stabilization, installation of a RCRA cap, and revegetation; collection and thermal destruction (method to be determined in design) of landfill gases; excavation of eroded landfill sand from wetlands, with replacement onsite, and vegetation of excavated wetland areas; access restrictions; and GW and air monitoring	Target cleanup levels for the gaseous emissions are the State Air Toxic Regulations. Individual goals were not specified	$5,674,000 - $6,790,000 (present worth)
I	Laurel Park, CT 19-Acre Industrial Landfill 06/30/88 1st-Final	Soil, sediments, GW, and SW contaminated with VOCs, organics, and metals	1,300,000 yd^3	Installation of a RCRA cap over all waste disposal areas; rehabilitation of existing leachate collection system supplemented by a shallow GW extraction system consisting of a french drain and/or GW extraction wells with discharge and offsite treatment at NWPCF; and monitoring of all media	GW and leachate will be extracted to meet the RCRA Ground Water Protection Standard (GWPS) at the point of compliance, which is the vertical surface at the hydraulically downgradient limit of the waste management area. Currently, the GWPS are set at MCLs, ACLs, or background. Individual cleanup levels were not specified	$21,706,300 (present worth) or $23,078,200 (including pretreatment, if necessary) (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	McKin Site, ME 07/15/83 IRM	GW, SW, soil, and air contaminated with VOCs including TCE and PCE	Not specified	Onsite cleaning and salvage of tanks; and offsite disposal of liquids and sludges	Not specified	$47,000 (capital) $0 (O&M)
I	McKin Site, ME 07/22/85 2nd–Final	GW, SW, and soil contaminated with VOCs including TCE and PCE	Not specified	Onsite soil aeration; offsite disposal of drums; soil testing of petroleum contaminated areas; GW pump and treatment; SW discharge system; reevaluation of GW performance standards; offsite GW and SW monitoring program; and site removal and closure activities	GW treatment will meet 10^{-5} cancer risk level criteria including 1,1,1-TCA 92 ug/l and TCE 28 ug/l. Soil will be treated to TCE 0.1 mg/kg	$3,919,000 (capital) $38,900 (annual O&M)
I	Nyanza Chemical, MA 09/04/85 1st	GW, SW, soil, and sediments contaminated with organics, inorganics, and metals	Not specified	Excavation and consolidation of sludge deposits and sediments with backfilling to original grade and revegetation of wetlands; RCRA capping over entire Hill area; construction of upgradient surface and GW diversion system; and downgradient GW monitoring	All outlying sludge deposits and contaminated soils and sediments associated with these deposits will be excavated to background levels for chromium, lead, and mercury	$5,600,000 - $9,800,000 (capital) $92,000 (O&M) (year 1) $70,000 (annual O&M) (years 2-30)
I	Old Springfield Landfill, VT 27-Acre Industrial/Municipal Landfill 09/22/88 1st	GW contaminated with VOCs including benzene, TCE, DCE, and vinyl chloride, and other organics including PCBs and PAHs		GW extraction and leachate collection with combined treatment onsite or discharge to a POTW; institutional controls; multimedia monitoring; and additional site studies	GW and leachate cleanup goals will attain MCLs and include benzene 5 ug/l, TCE 5 ug/l, DCE 7 ug/l, and vinyl chloride 2 ug/l	$5,374,000 (present worth) $173,000 (annual O&M)
I	Ottati & Goss, NH 01/16/87 1st–Final	Soil, sediments, and GW contaminated with VOCs including TCE, organics including PCBs, and organics	19,000 yd^3	Onsite incineration of 5,000 yd^3 soil and sediments with > 20 mg/kg PCBs; aeration of 14,000 yd^3 of soils <20 mg/kg PCBs and >1 mg/kg total VOCs; GW pump and treatment using air stripping, biological treatment, and ion-exchange with reinjection; and onsite backfilling of all residuals with grading and covering	Soil, sediments, and GW will attain the health-based cleanup level of 10^{-5}. Specific GW goals include 1,2-DCE 3.8 ug/l, TCE 26.0 ug/l, PCE 6.7 ug/l, and benzene 13.0 ug/l. Specific soil and sediment goals include PCBs 20.0 mg/kg and total VOCs 1.0 mg/kg	$8,592,500 (capital) $1,735,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Picillo Farm, RI 09/30/85 1st	GW and soil contaminated with PCBs, and VOCs including TCE	3,500 yd^3	Onsite disposal of primarily PCB and phenol contaminated soils in a RCRA/TSCA landfill; and site closure activities	Not specified	$841,000 (capital) $12,120 (O&M) (year 1) $25,648 (annual O&M) (years 2-4) $19,048 (annual O&M) (years 5-30)
I	Re-Solve, MA 07/01/83 1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not specified	Excavation and offsite disposal of lagoon contents and highly contaminated soil; and clay capping of entire site	Not specified	$3,050,000 (capital) $36,000 (annual O&M)
I	Re-Solve, MA 09/24/87 2nd-Final	Soil, sediments, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation with KPEG dechlorination and onsite placement of 22,500 yd^3 of soil and 3000 yd^3 of sediments; GW pump and treatment using air stripping and carbon adsorption with reinjection; and institutional controls restricting GW usage	Soils will be treated to PCBs 25.0 mg/kg based on the 10^{-5} cancer risk level. Sediments will be treated to PCBs 1.0 mg/kg. GW will be treated to the 10^{-5} cancer risk which includes MCL values for TCE, PCE, and methylene chloride of 5.0 ug/l each	$7,332,900 (capital) $1,097,000 (present worth O&M)
I	Rose Disposal Pit, MA Waste Disposal Area 09/23/88 1st-Final	Soil, sediments, GW and SW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes, and PCBs	60,000 yd^3 (soil)	Excavation and onsite incineration of 15,000 yd^3 of soil and sediment with residual disposal onsite; GW pump and treatment along with SW using air stripping and carbon adsorption with discharge to the aquifer; and institutional controls	Soil with PCBs in excess of 13 mg/kg (based on a 10^{-5} risk level) will be incinerated to a concentration less than 2 mg/kg for PCBs. GW cleanup goals are set at or below MCLs, if available, MCLGs, Lifetime Health Advisory (LHA) or a 10^{-6} cancer risk level. Individual GW goals include TCE (MCL), benzene (MCL), and PCE 1 ug/l (10^{-6} risk level)	$6,450,000 (present worth) $5,790,000 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Sylvester, NH 07/29/82 IRM	GW, SW, and air contaminated with VOCs, inorganics, and heavy metals	Not specified	Capping with installation of a slurry wall	Not specified	$8,822,000 (capital) $750,000 (annual O&M)
I	Sylvester, NH 09/22/83 1st	GW, SW, and air contaminated with VOCs, inorganics, and metals	Not specified	GW pump and treatment system	GW treatment will attain ACLs	$4,696,400 (capital) $1,380,000 (annual O&M)
I	Tinkham Garage, NH 09/30/86 1st–Final	GW, SW, and soil contaminated with VOCs including TCE and PCE, organics, and metals	10,800 yd^3	Excavation and onsite treatment of soils via aeration, soil washing, or composting followed by onsite disposal; GW pump and treatment at POTW; and restoration of wetlands	At a minimum, soil will be treated to TVO 1 mg/kg. GW will be treated to 5 ug/l for PCE and TCE	$2,058,000 (capital) $874,000 (annual O&M)
I	Western Sand & Gravel, RI 09/28/84 1st	GW contaminated with VOCs including TCE, and organics	Not specified	Installation of carbon canister filters as a temporary measure; and installation of a permanent alternate water supply	Not specified	$1,493,513 (present worth) $156,800 (annual O&M) (year 1) $100,800 (annual O&M) (years 2-30)
I	Winthrop Landfill, ME 11/22/85 1st–Final	GW contaminated with organics	Not specified	RCRA capping; alternate water supply; and institutional controls	ACLs for each GW contaminant will be established based on RCRA criteria. If ACL not established, protection will be to background levels	$6,000,000 (capital) $42,000 (annual O&M if ACL not exceeded) $360,000 – $1,480,000 (annual O&M if ACL exceeded)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
I	Yaworski Lagoon, CT Waste Disposal Area 09/29/88 1st-Final	Soil, sediments, GW and debris contaminated with VOCs including benzene, toluene, and xylenes, organics including PAHs, and metals including chromium and lead	65,000 yd^3 (sludge) 60,000 yd^3 (debris)	Installation of a RCRA cap over lagoon area; reconstruction of lagoon dike to improve flood control; GW monitoring; and GW treatment with method to be established as part of corrective action program, if necessary	GW cleanup levels will meet ACLs established as part of the selected remedy. Individual ACLs were not specified	$1,673,000 (capital) $716,000 (present worth O&M)
II	American Thermostat, NY Industrial Facility 01/07/88 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Extension of the existing Catskill Water District pipeline to affected and potentially affected areas; the contaminated GW and surrounding areas will be cleaned up by the owner of the property	GW cleanup goals will meet MCLs for TCE 0.005 mg/l, 1,1-dichloroethylene 0.007 mg/l, and 1,1-trichloroethane 0.200 mg/l, and the Water Quality Criteria chronic level for PCE 0.800 mg/l	$2,270,000 - $2,380,000 (capital) $100,000 - $110,000 (annual O&M)
II	Asbestos Dump, NJ Industrial Facility 09/30/88 1st	Soil and GW contaminated with asbestos	90,000 yd^3 (asbestos waste)	Installation of a soil cover; construction of slope protection/ stabilization measures along asbestos mound embankment, and surface runoff diversion channels; GW monitoring; institutional controls restricting GW usage and land development; access restrictions; and treatability studies to evaluate technologies that may permanently remediate asbestos	Remedy addresses containment of asbestos, thus individual cleanup goals are not applicable	$1,145,000 (present worth) $56,000 - $161,000 (annual O&M)
II	Beachwood/ Berkeley Wells, NJ Residential Plumbing System 06/30/88 1st-Final	Drinking water contaminated with lead	Not specified	No man-made or industrial contaminant source is causing the elevated lead levels in drinking water. Remediation under the Superfund program is precluded by law. The State of New Jersey is proceeding independently to address the problem	Not applicable	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Bog Creek Farm, NJ 09/30/85 1st	GW, soil, and sediments contaminated with VOCs, organics, and metals	Not specified	Removal of waste water and sediments from pond and bog with regrading and covering of both areas and treatment of waste water with discharge to stream; excavation of VOC contaminated soil with onsite or offsite incineration; evaluation of soil washing, segregation, and other technologies to reduce the volume of soils to be incinerated; compacted soil capping; fencing around site and work areas; and evaluation of monitoring program effectiveness	Excavation of soil with >10,000 mg/kg TVOs	$9,200,000 (capital) $54,400 (annual O&M)
II	Brewster Well Field, NY 09/30/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using existing air stripping facilities with reinjection to the aquifer	Existing air stripping system exceeds State and Federal ARARs for GW which include TCE 10 ug/l (State) and 5 ug/l (Federal)	$163,912 (capital) $27,468 (annual O&M)
II	Brewster Well Field, NY Municipal Well Field 09/29/88 2nd–Final	Soils, sediments, sludge, and debris contaminated with VOCs including PCE and TCE	100 yd^3	Excavation and offsite incineration of drywell sediments, sludge and soil with greater than 4 mg/kg PCE, followed by offsite disposal; and removal, decontamination and offsite disposal of the concrete drywell structure and debris	Remediation of all soil, sediments, sludge and debris containing greater than 4 mg/kg PCE will reduce health risks due to direct contact with contaminated site soils to $1x10^{-6}$	$241,940 (capital)
II	Bridgeport, NJ 12/31/84 1st–Final	GW, SW, soil, and sediments contaminated with VOCs and PCBs	Not specified	Disposal of oily waste, sediment, and sludge via onsite incineration; removal and disposal of contaminated water using onsite treatment; drum excavation with offsite removal; maintenance pumping; removal and offsite disposal of tanks and waste; and installation of an alternate water supply pipeline	GW must meet TOC limit of 50 mg/l on a 30 day average	$57,672,000 (capital) $20,000 (annual O&M)
II	Burnt Fly Bog, NJ 11/16/83 1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not specified	Excavation and offsite disposal of liquids, sludges, asphalt piles, drums, and contaminated soil from lagoons and northern wetlands; restoration of original site contours and vegetation; and implementation of a 5-year GW monitoring program	Not specified	$2,200,000 (capital) (Phase I) $5,110,000 (capital) (Phase II) $60,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Burnt Fly Bog, NJ Industrial Waste Disposal Area/Municipal Landfill 09/29/88 2nd	Soil, sediments, and SW contaminated with PCBs and lead	82,000 yd^3 (soil and sediments)	Excavation and offsite disposal of approximately 5,600 yd^3 of contaminated downstream sediments; containment through a sedimentation basin and diversion controls of remaining contaminated soil and sediments; access restrictions; and performance of treatability studies to determine final treatment for contained contaminated soil and sediments	Remedy is an interim action designed to control contaminant migration pending treatability study results. Cleanup goals for the downstream sediments will meet the State soil cleanup criteria of PCBs 5 mg/kg and lead 250 mg/kg	$3,000,000 (present worth for three-year life) or $6,100,000 (present worth for 20-year life) $320,000 (annual O&M)
II	Caldwell Trucking, NJ 09/25/86 1st	GW and soil contaminated with PAHs, PCBs, VOCs including TCE, inorganics, and metals including lead	28,000 yd^3	Excavation and heat addition treatment of soil and waste materials with onsite disposal; GW treatment using air stripping; and provision of an alternate water supply	Not specified	$5,490,000 (capital) $48,000 (annual O&M)
II	Chemical Control, NJ 09/19/83 1st	GW and soil contaminated with VOCs, organics including PCBs, pesticides, and inorganics	Not specified	Removal of gas cylinders; reconstruction of storm sewer catch basins and grates; cleaning of the storm sewer system with constructon of curbing; and decontamination of box trailer and vacuum truck	Not specified	$732,500 (capital) $0 (O&M)
II	Chemical Control, NJ 09/23/87 2nd	Soil contaminated with VOCs, organics, inorganics, and pesticides	18,000 yd^3	In-situ fixation of 18,000 yd^3 of soil; repairing berm to prevent surface runoff into adjacent river; removal of debris; and sealing of a sanitary sewer	Cleanup goals for contaminants in the soil were not specified	$7,208,000 (capital) $57,400 (annual O&M) (year 1-5) $22,400 (annual O&M) (years 6-30)
II	Combe Fill North, NJ 09/29/86 1st-Final	GW and soil contaminated with organics and low levels of VOCs	Not specified	Capping with grading and compacting of disposal areas; installation of drainage and venting systems; and site fencing	Not specified	$10,500,000 (capital) $168,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Combe Fill South, NJ 09/29/86 1st–Final	GW and soil contaminated with VOCs including TCE and PCE	Not specified	RCRA capping; active gas collection and treatment system; GW and leachate pump and treatment with discharge to brook; alternate water supply; SW controls; and fencing	Not specified	$46,060,700 (capital) $673,000 (annual O&M)
II	Cooper Road, NJ 09/30/87 1st–Final	None	Not applicable	No further action	Not specified	$0
II	Diamond Alkali, NJ 09/30/87 1st	Soil, debris, GW, and air contaminated with pesticides including TCDD and DDT	Not specified	Construction of site slurry wall and flood wall; disassembly and decontamination of structures and materials for offsite reuse, recycling, or disposal; offsite transportation of all drums containing hazardous substances >1 ug/kg TCDD for treatment or disposal; securing of all material with >1 ug/kg TCDD onsite; stabilization of remaining drums with dioxin-contaminated materials; GW pump and treatment; plugging or rerouting underground conduits; and onsite placement and capping of sludge	Cleanup levels will attain 10^{-6} cancer risk level. GW will be treated to include dioxin 1.4 x 10^{-5}ug/l, DDT 2.4 x 10^{-2} ug/l, and hexachlorobenzene 7.4 x 10^{-1} ug/l. Soil and structures will be treated to dioxin 1.0 ug/l	$8,068,000 (capital) $261,000 (annual O&M)
II	D'Imperio Property, NJ 03/27/85 1st–Final	GW and soil contaminated with VOCs	3,900 yd^3	Excavation and offsite disposal of contaminated waste, soil, and surface drums; RCRA capping; and GW pump and treatment	Cleanup will be monitored and assessed in accordance with Drinking Water Standards to determine need for additional remediation	$4,251,551 (capital) $1,169,449 (present worth O&M)
II	Endicott Village Well Field, NY 09/25/87 1st	GW contaminated with VOCs	3,700 gpm (to be treated)	GW treatment with air stripping and chlorination; and continued operation of an existing purge well to intercept contamination on its way to the supply well	GW treatment will attain MCL values which include vinyl chloride 2 ug/l, 1,2-dichloroethane 5 ug/l, and trichloroethane 5 ug/l. Tetrachloroethene 0.88 ug/l and 1,1,2-trichloroethane 0.6 ug/l will meet levels established by the FWQC, and will meet the 10^{-6} cancer risk level. Vinyl chloride air emission will meet the National Emission Standard for Clean Air of 10 ppm	$1,200,000 (capital) $147,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Ewan Property, NJ Illegal Waste Disposal/Dumping Area 09/29/88 1st	Soil contaminated with VOCs including benzene, TCE, PCE, and xylenes, and metals including chromium and lead	500-8,000 drums 4,500 yd^3 (heavily contaminated soil and drum contents) 29,500 yd^3 (moderately contaminated soil and drum contents)	Excavation and offsite incineration of approximately 4,500 yd^3 of contaminated soil/waste; additional assessment of non-incinerable waste to determine the appropriate remediation; and GW and air monitoring	Final cleanup goals will be determined during a subsequent operable unit	$21,153,000 (present worth) $22,000 (annual O&M)
II	Florence Landfill, NJ 06/27/86 1st-Final	GW and soil contaminated with VOCs and metals	Not specified	Capping with slurry wall containment system; removal and onsite disposal of lagoon liquids and surface debris; leachate collection, treatment, and offsite disposal; gas collection and treatment; and partial fencing	Not specified	$8,021,000 (capital) $170,000 (annual O&M)
II	Friedman Property, [illegible] 04/30/85 1st-Final	No threat	None	No action with five-year onsite well monitoring; and deed restrictions	Not specified	(capital) $0 $12,000 (annual O&M)
II	GE Moreau, NY 07/13/87 1st	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PCBs	8,600 yd^3	Excavation of soil with disposal under cap; slurry wall installation (completed); SW and GW treatment with air stripping; and extension of municipal water supply to affected residents	Soil cleanup goals were not specified. GW and SW treatment will attain the MCL for TCE 5.0 ug/l and the State guidance value for 1,2-DCE 50.0 ug/l	$16,382,000 (capital) $78,000 (annual O&M)
II	GEMS Landfill, NJ 09/27/85 1st-Final	GW, SW, soil, and air contaminated with VOCs, inorganics, and organics	Not specified	Capping with regrading of existing landfill slopes; gas collection and treatment system; GW pump and treatment with discharge to POTW or SW; remediationof Holly Run and BriarLake; SW controls; fencing; and extension of existing water supply system	Discharge criteria will be established by the State and are dependent on the point of discharge (to be determined)	$27,365,000 (capital) $601,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	GE Wiring Devices, PR Industrial Facility 09/30/88 1st-Final	Soil, perched GW, and debris contaminated with mercury	1,500 yd^3 (soil) 500,000 gals (perched GW) 4,000 yd^3 (debris)	Onsite hydrometallurgical treatment of the soil, perched GW, and waste-fill materials with residue disposed of in the former waste-fill area, followed by covering with a clean soil cover and onsite treatment of the leaching agent with residual discharge to POTW; additional investigation of the GW to determine extent of contamination; and limited GW monitoring, if GW remediation is not required	Soil, perched GW, and waste-fill material will be treated to either 16 ppm, if further air sampling verifies levels exceeding the EPA National Emission Standard for a Hazardous Material (NESHAP), or 21 ppm based on risk due to ingestion, if there are no levels exceeding NESHAP	$1,912,870 (capital) $0 (O&M)
II	Goose Farm, NJ 09/27/85 1st	GW, SW, and soil contaminated with VOCs including TCE, and organics including PCBs	Not specified	GW and soil flushing with GW treatment and reinjection into soil; and conduction of testing programs to evaluate capping and extent of drum pit PCB contamination	GW treatment system will be designed to meet NPDES permit limits	$3,014,000 (capital) $0 (O&M)
II	Haviland Complex, NY 09/30/87 1st-Final	Sediments and GW contaminated with VOCs and metals	Not specified	GW pump and treatment with air stripping; provision of an alternate water supply; and excavation of contaminated sediments from local septic disposal systems	Specific treatment goals will be determined during pilot studies	$1,257,500 (capital) $105,500 (annual O&M)
II	Helen Kramer, NJ 09/27/85 1st-Final	GW and SW contaminated with VOCs including TCE, organics, and inorganics	Not specified	Clay capping with slurry wall containment system; gas collection and treatment system; dewatering, excavation, and filling of leachate ponds and lagoons; fencing of site and work areas; SW controls; and GW and leachate collection and treatment with disposal at POTW or to SW	Not specified	$36,478,000 or $38,089,000 (capital) (pending onsite treatment) $1,047,900 (annual O&M) (year 1 pretreatment) $792,100 (annual O&M) (complete onsite treatment)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Hudson River, NY 09/25/84 1st-Final	Soil and river sediments contaminated with PCBs	Not specified	In situ containment of remnant shoreline deposits; and evaluation of Waterford water treatment facility	Not specified	Not specified
II	Hyde Park, NY 11/26/85 1st-Final	GW and soil contaminated with VOCs, and organics including PCBs and dioxin	80,000 tons	Extraction and incineration of non-aqueous phase liquids; GW pump and treatment using activated carbon; and construction of plume contaminant systems	The 10^{-6} cancer risk level will be achieved	$17,000 (present worth) O&M (not specified)
II	Katonah Municipal Well, NY 09/25/87 1st-Final	GW contaminated with VOCs including PCE	Not specified	Installation of a new GW production well and onsite treatment with air stripping prior to discharge to POTW	The cleanup goal for PCE is less than 1.0 ug/l or nondetectable and is based on 10^{-6} cancer risk level	$1,365,000 (capital) $296,000 (annual O&M)
II	Kentucky Avenue Well Field, NY 09/30/86 1st	GW contaminated with VOCs including TCE	Not specified	Extension of public water supply to private well users; and GW monitoring	Remedy will attain the MCL for TCE 5 ug/l	$303,800 (capital) $19,000 (annual O&M)
II	Kin-Buc Landfill, NJ 220-Acre Municipal/ Industrial Landfill 09/30/88 1st	Sediments, GW, SW, and air contaminated with VOCs including benzene and toluene, organics including PAHs, and PCBs, and metals including arsenic and lead	3,000,000 gals (oily-phase leachate) 1,000,000 tons (solid waste)	Installation of a slurry wall surrounding the site, RCRA capping over Kin-Buc II, portions of the low-lying area between Kin-Buc I and the Edison Landfill, and Pool C, as well as maintenance, and upgrading if necessary, of Kin-Buc I cap; collection of oily-phase leachate with offsite incineration and residual disposal; collection and onsite treatment of aqueous-phase leachate and contaminated GW with discharge either to SW or POTW; and GW monitoring	Incineration of oily-phase leachate will meet six nines (99.9999%) destruction and removal efficiency. Aqueous-phase leachate and contaminated GW discharge criteria will be established by NJDEP following treatability studies, but will meet NJAC water quality criteria and state wastewater discharge requirements. Individual cleanup goals were not specified	$16,635,000 - $16,290,000 (present worth) Annual O&M varies from $848,000 (year 1) to $405,000 (years 12-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Krysowaty Farm, NJ 06/20/84 1st-Final	GW and soil contaminated with VOCs, organics, and pesticides	Not specified	Excavation and offsite disposal of contaminated soil and waste; and provision for a permanent alternate water supply	Not specified	$2,164,014 (capital) $145,698 (annual O&M)
II	Lang Property, NJ 09/29/86 1st-Final	GW, SW, soil, and sediments contaminated with VOCs and metals	6,500 yd^3	Excavation and offsite disposal of soils and waste material with filling and grading; GW pump and treatment with reinjection into aquifer; and fencing	GW treatment effluent will attain SDWA criteria	$2,322,000 (capital) $612,000 (annual O&M)
II	Lipari Landfill, NJ 08/03/82 1st	GW, SW, and soil contaminated with VOCs and organics	Not specified	Capping with slurry wall containment system; and GW collection and onsite treatment at POTW	Not specified	$1,769,150 (capital) $91,250 (annual O&M)
II	Lipari Landfill, NJ 09/30/85 2nd	GW and soil contaminated with VOCs including toluene, organics, and metals	Not specified	GW and leachate extraction with injection wells within containment system for flushing and dewatering with onsite pretreatment and discharge to POTW; and flushing of containment system for cleansing	Marginal successive flushing cycle benefits and effects of leachate release into GW will be evaluated within 5 years	$3,464,000 (capital) $715,000 (annual O&M)
II	Lipari Landfill, NJ 6-Acre Industrial/ Municipal Landfill 07/11/88 3rd-Final	Soil, sediments, GW, SW and air contaminated with VOCs including benzene, toluene, and xylenes, and metals including arsenic, chromium, and lead	Not specified	GW/leachate pump and onsite treatment with discharge to POTW; marsh soil excavation and thermal treatment with offsite disposal; sediment dredging, dewatering and thermal treatment with offsite disposal; temporary measures, if necessary, to reduce volatile emissions; and integration of offsite sampling with onsite monitoring plan	Soil cleanup will attain New Jersey soil cleanup objectives and health or real-based criteria. SW cleanup will meet Federal Water Quality Criteria and State surface water standards. Individual goals were not provided	$21,000,000 (present worth)
II	Lone Pine Landfill, NJ 09/28/84 1st-Final	GW, SW, and soil contaminated with VOCs, pesticides, and metals	Not specified	Multi-layer surface sealing with slurry wall containment system; and GW collection and treatment at POTW or onsite plant	Not specified	$10,642,050 (capital) $324,734 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Love Canal, NY 05/06/85 1st	SW, sediments, and air contaminated with VOCs, organics, pesticides including dioxin, and metals	Not specified	Removal and dewatering of contaminated creek sediments; inspection of sewer reaches for defects, repairing of damaged flood gate, and hydraulic cleaning of designated sewers; dredging and cleaning of culverts; berm construction; interim onsite storage of sediments; and installation of an administration building	CDC recommends soil treatment to TCDD 1 ug/kg	$8,929,000 - $12,000,000 (capital) O&M (not specified)
II	Love Canal, NY Waste Disposal Facility 10/26/87 2nd	Sediments and debris contaminated with dioxin	30,000 - 40,900 yd^3	Construction of an onsite dewatering/ containment facility (DCF) and a separate construction/ demolition debris facility (CDF); onsite containment of sewer and creek sediments in the DCF prior to thermal destruction in a transportable thermal destruction unit; onsite storage in the DCF of leachate treatment residuals and other "associated" material generated as a result of remediation; and onsite storage of uncontaminated debris in the CDF	The CDC level of 1 ug/kg for dioxin in residential soils is not implementable and would lead to unacceptable project delays. Additionally, the community is opposed to anything less than complete thermal destruction. As a result, all materials (excluding 5,500 yd^3 of house debris) will be thermally destroyed. Six nines (99.9999%) destruction and removal efficiency will be the goal. Excavation to approximately 18 inches will ensure elimination or reduction of risk	$26,400,000 - $31,400,000 (present worth)
II	Love Canal/93rd Street School, NY Waste Disposal Area 09/26/88 3rd	Soil contaminated with VOCs including toluene and xylenes, organics including dioxins, PAHs, and pesticides, and metals including arsenic and lead	7,500 yd^3	Excavation and solidification or stabilization of contaminated soil; replacement of solidified soil into excavation; installation of a RCRA cap; and sampling, analysis, and monitoring of GW	Soil cleanup will meet the Land Disposal Restrictions requirements for dioxin of less than 1 ug/l using the TCLP test	$2,295,000 - $3,675,000 (capital) $121,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Ludlow Sand and Gravel, NY Landfill 09/30/88 1st-Final	Soil, sediments, and GW contaminated with VOCs and organics including PCBs and phenols	10,000 yd^3 (soil and sediment)	Consolidation and disposal in the onsite landfill of contaminated soil and sediments, followed by RCRA capping; leachate/GW collection and dewatering of the landfill with onsite treatment and offsite residual discharge; hydraulic containment of the landfill through implementation of upgradient GW controls; deed and access restrictions; and long-term water quality monitoring including GW, SW, and potable water supply wells	Leachate/GW cleanup will attain substantive requirements of State Pollution Discharge Elimination System, Technical Operations Guidance Series, Ambient Water Quality Standards and Guidance Values, all GW and SW standards, and State Freshwater Wetlands Standards. Soil cleanup will attain 10 mg/kg for PCBs based on TSCA policy	$3,727,200 - $14,548,900 (present worth) $58,900 - $364,900 (annual O&M)
II	Marathon Battery, NY 09/30/86 1st	SW, sediments, and biota contaminated with metals including cadmium, nickel, and cobalt	30,083 yd^3	Hydraulic dredging of sediments with chemical fixation and offsite disposal; dredging, water treatment, and disposal; marsh restoration; and site access restrictions	Sediments will be treated to a 100 mg/kg established background concentration. Standards for total cadmium water concentrations include 6.6×10^{-4} mg/l and 2.0×10^{-3} mg/l for water hardness levels of 50 mg/l and 200 mg/l, respectively	$16,640,000 (capital) $3,530,000 (annual O&M) (year 1) $180,000 (annual O&M) (years 2-5) $127,000 (annual O&M) (years 6-30)
II	Marathon Battery Company, NJ Industrial Facility 09/30/88 2nd	Soil, sediments, GW, and debris contaminated with VOCs including PCE and TCE, and metals including cadmium and nickel	6,100 yd^3 (soil) 5,000 yd^3 (sediment) 110 yd^3 (dust)	Decontamination of the inside surfaces and contents of the former battery facility, and excavation of cadmium-contaminated soil and the dredge spoils vault, followed by onsite fixation of the excavated soil, dust and vault sediments with offsite disposal, and backfilling excavated areas; excavating the VOC - contaminated soil hotspots, followed by enhanced volatilization and replacement of the clean residuals onsite; GW monitoring; institutional controls; and evaluation and performance of repairs, if needed, to the inoperable sprinkler and heating systems inside the former battery. facility	ACLs are provided as GW cleanup goals for indicator compounds. The ACLs are below Federal and State MCLs, if available, and include PCE 0 ug/l and TEC 3 ug/l. These goals will be attained in 3-10 years by natural attenuation. Excavation of cadmium-contaminated soil will attain an ATSDR-recommended level of 20 mg/kg	$10,010,000 (present worth) $775,000 (annual O&M year 1) $17,000 (annual O&M years 2-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Metaltec/Aero-Systems, NJ 06/30/86 1st	Soil and GW contaminated VOCs including TCE and PCE, and metals including copper, chromium, and lead	10,000 yd^3	Excavation with heat treatment and offsite disposal of soils; and alternate water supply	MCLs and State guidelines set action levels for GW of TCE 5 ug/l and PCE 5 ug/l. Soil action levels include copper 170 mg/kg, chromium (total) 100 mg/kg, and lead 100 mg/kg	$7,005,000 (sanitary landfill) or $11,735,000 (RCRA landfill) (capital) $179,000 (annual O&M)
II	Montgomery Township, NJ 09/29/87 1st	GW contaminated with VOCs including TCE	Not specified	Extension of Elizabethtown water supply system to affected residences	Water supply will be monitored regularly for compliance with MCLs	$319,000 (capital) $0 (O&M)
II	Montgomery Township Housing Development, NJ Residential Area 06/30/88 2nd-Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment onsite using air stripping with reinjection into the aquifer; connecting remaining affected residences to public water supply, and sealing remaining private water supply and monitoring wells within plume; and GW monitoring	GW cleanup will meet the State MCL for TCE of 1.0 ug/l	$2,548,000 (present worth) $94,000 (annual O&M)
II	Nascolite, NJ Industrial Facility 03/31/88 1st	Soil, GW, and debris contaminated with VOCs and organics	Not specified	GW pump and treatment using a method to be determined after pilot testing, followed by reinjection; performance of additional soil and onsite building studies to determine future measures; and provision of an alternate water supply for potentially affected residents	ROD did not specify chemical-specific goals but indicated attainment of CWA, SDWA, SWDA, NJSDWA, and NJWQC. Additionally, carcinogenic compounds without cleanup standards will attain the 10^{-6} health-based risk level. Any other contaminants will attain the goal of 5 ug/l individually and 50 ug/l total noncarcinogenic and "non-a-280" compounds	$609,000 (capital) $266,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Old Bethpage, NY 65-Acre Municipal/ Industrial Landfill 03/17/88 1st-Final	GW contaminated with benzene, and toluene, and metals including chromium and lead; air contaminated with methane gas and VOCs	Not specified	GW pump and treatment using air stripping and, if necessary, carbon filtration with discharge into an upgradient injection well system; hydraulic control of the plume through installation of GW recovery wells; GW monitoring; completion of the landfill capping (29 acres previously capped); continuation and expansion, or enhancement, of the leachate control and gas collection systems; and gas monitoring	The plume will be treated to State standards or to a zero-slope condition if one exists following 5 or more years of pumping. Individual goals include chromium 0.05 mg/l, lead 0.025 mg/l, TCE 5.0 mg/l (MCL), benzene non-detectable, and toluene 50 mg/l. Air discharge requirements also will meet State standards. Individual goals include methylene chloride 1.17×10^3 ug/m^3, TCE 9.0×10^2 ug/m^3, benzene 1.0×10^2 ug/m^3, and toluene 7.5×10^3 ug/m^3	$23,045,000 (present worth)
II	Olean Well Field, NY 09/24/85 1st	GW contaminated with VOCs including TCE	Not specified	Reactivation of municipal wells; construction of two air stripping systems for GW treatment with discharge to public water supply system; extension of existing Clean water lines; inspection of McGraw Edison industrial sewer and analysis of repair and replacement options; and recommendation of institutional controls to restrict GW usage	GW will be treated to TCE 5 mg/kg	$1,996,780 (capital) $799,040 (annual O&M)
II	PAS Oswego, NY 06/06/84 1st-Final	Soil contaminated with organics, VOCs, and metals	Not specified	Limited excavation and offsite removal of contaminated soil, subsurface tanks, and drums; RCRA capping with slurry wall containment system and site grading; and GW and leachate recovery and treatment	Not specified	$1,363,700 (capital) $117,000 (annual O&M)
II	Pijak Farm, NJ 09/30/84 1st-Final	GW and soil contaminated with VOCs, PCBs, organics, pesticides, and metals	Not specified	Removal and offsite disposal of drums and lab packs; and excavation and offsite disposal of visibly contaminated soil with GW pumping and removal	Not specified	$1,962,750 (capital) $53,600 (annual O&M)
II	Price Landfill, NJ 09/20/83 1st	GW and soil contaminated with VOCs and organics	Not specified	Replacement and relocation of the water supply well field and transmission facilities; and analysis of plume management, source control and GW treatment remedies	Not specified	$5,070,000 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Price Landfill, NJ 09/29/86 2nd-Final	GW contaminated with VOCs including TCE, organics, and inorganics	Not specified	GW pump and onsite pretreatment with discharge to a POTW; site capping; and fencing	Extraction and treatment will continue until TVO concentration reaches 10 ug/l or less in GW	$9,050,000 (capital) $1,010,000 (annual O&M) (years 1-5) $255,000 (annual O&M) (years 6-25)
II	Reich Farm, NJ Illegal Waste Disposal Area 09/30/88 1st-Final	Soil and GW contaminated with VOCs including PCE, toluene, TCE and xylenes, and organics	2,010 yd^3	Soil excavation and onsite treatment through enhanced volatilization and onsite disposal and/or offsite incineration and disposal; GW pump and treatment onsite using air stripping and carbon adsorption with reinjection to the aquifer; and additional GW and soil sampling	GW will be treated to attain State MCLs for TCA 26 ug/l, TCE 1 ug/l, and PCE 1 ug/l. Soil cleanup levels will meet State Soil Action Levels of total VOCs 1 mg/kg and total semi-volatile organics 10 mg/kg	$5,832,000 (present worth) $419,550 (annual O&M)
II	Renora, Inc., NJ 09/29/87 1st	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and pesticides	5,500 yd^3	Biodegradation of 4,400 yd^3 of PAH contaminated soil; excavation of 1,100 yd^3 of PCB contaminated soil with offsite disposal (landfilling or incineration); and backfilling, grading, and revegetation	Soil will be treated to total VOCs 1.0 mg/kg, total PAHs 10.0 mg/kg, total petroleum hydrocarbons 100.0 mg/kg, cadmium 3.0 mg/kg, zinc 350.0 mg/kg, and PCBs 5.0 mg/kg. GW will be treated to total VOCs 50.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$1,401,000 (landfilling) (present worth) or $6,021,000 (incineration) (present worth)
II	Ringwood Mines/Landfill, NJ Waste Disposal Area/Landfill 09/29/88 1st-Final	Soil and GW contaminated with metals including arsenic and lead, and petroleum hydrocarbons	Not specified	Soil sampling and excavation, if necessary, with offsite disposal, backfilling, regrading, and revegetation; and GW and SW monitoring	Soil cleanup will attain the non-promulgated New Jersey Cleanup Objectives for lead 250 mg/kg and total petroleum hydrocarbons 100 mg/kg. GW will attain MCLs, including arsenic 50 ug/l and lead 50 ug/l, by natural attenuation	$225,000 (capital) $50,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Rockaway Borough Well Field, NJ 09/29/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW treatment using existing system	Municipal treatment system will be designed in accordance with SDWA standards to remove TCE and PCE to 5 ug/l each	$0 (capital) $74,800 (annual (O&M)
II	Rocky Hill, NJ Municipal Well Field 06/30/88 1st-Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping with reinjection; alternate water supply; sealing remaining wells; and GW monitoring	Remediation will meet a 0.12×10^{-6} excess cancer risk level. The TCE cleanup goal of 1 ug/l corresponds to the proposed NJ MCL. PCE and 1,1-dichloroethane will be reduced to below 1 ug/l and 2 ug/l, respectively	$1,618,000 (capital) $84,000 (annual O&M)
II	Sharkey Landfill, NJ 09/29/86 1st-Final	GW and soils contaminated with VOCs including TCE, inorganics, and metals	Not specified	Capping; and GW pump and treatment	Not specified	$23,173,000 (capital) $330,000 (annual O&M)
II	Sinclair Refinery, NY 09/30/85 1st	Soil contaminated with VOCs and metals	Not specified	Removal and offsite disposal of 300 drums; backfilling with clean fill; onsite consolidation of waste from South Landfill area with RCRA capping; site fencing; and partial river channelization	GW and SW will be treated to total organics 100 ug/l, toluene 10 ug/l, 1,1,1-trichloroethane 50 ug/l, arsenic 5 ug/l, zinc 30 ug/l and PCBs 0.0095 ug/l. Soil will be treated to toluene 72 ug/l, trans-1,2-dichloroethylene 325 ug/kg, arsenic 15,000 ug/kg, zinc 53,000 ug/kg, and PCBs 12.1 ug/kg	$8,759,000 (capital) $30,000 (annual O&M)
II	South Brunswick Landfill, NJ 09/30/87 1st-Final	GW and SW contaminated with VOCs and metals	Not specified	Remediation completed in 1985 (capping, slurry wall, and leachate collection system). Post-remediation monitoring will continue for 30 years	Chemical-specific levels will be addressed in he post remedial monitoring program	$0 (no additional funding necessary)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Spence Farm, NJ 09/30/84 1st	GW and soil contaminated with organics, metals, and inorganics	Not specified	Excavation and offsite disposal of all drums, lab packs, and visibly contaminated soil; and site grading and surface restoration	Not specified	$845,500 (capital) $95,300 (annual O&M)
II	Suffern Village Well Field, NY 09/25/87 1st–Final	Potential contamination of GW with VOCs	Not applicable	No further action with GW monitoring	GW levels for 1,1,1-TCA comply with the NYSDEC guideline of 50.0 ug/l	$0 (capital) $311,000 (present worth O&M)
II	Swope Oil, NJ 09/27/85 1st	GW and soil contaminated with VOCs, and organics including PCBs	Not specified	Capping; removal of tanks and building debris with offsite incineration; treatment or disposal of tank contents with offsite disposal of tanks and building debris; excavation and offsite disposal of buried sludge waste area; and excavation and offsite disposal of PCB contaminated soil	In accordance with State policy, soils will be excavated up to 1.5 feet, which contain PCBs >5 mg/kg	$5,590,356 (capital) $33,000 (annual O&M)
II	Syncon Resins, NJ 09/29/86 1st	GW, soil, and sediments contaminated with VOCs, PCBs, organics, pesticides, and metals	700 yd^3 2,000 yd^3	Excavation of lagoon sediments and highly contaminated subsurface soils with offsite disposal Excavation and offsite disposal of surface soils; and GW pump and treatment	Soil removal to achieve PCBs 5 mg/kg, base-neutrals 100 mg/kg, TVOs 1 mg/kg, and numerous levels for metals. No standards have been set for GW treatment	$5,600,000 (capital) $209,000 (annual O&M)
II	Tabernacle, NJ Waste Disposal Area 06/30/88 1st–Final	GW contaminated with VOCs including 1,1,1-TCA and DCE	Not specified	Installation of GW monitoring wells with implementation of a monitoring program to delineate extent of plume; GW treatment using air stripping followed by reinjection; exhaust gas analysis; and soil sampling of former drum dumping and storage area	The proposed MCLs established by NJDEP are more stringent than Federal standards and include 1,1,1-TCA 26 ug/l and DCE 2 ug/l. The remedial action will comply with the NJDEP levels in anticipation that they will become State ARARs	$772,600 (capital) $215,600 (present worth O&M)
II	Upjohn Manufacturing Company, PR Industrial Facility 09/30/88 1st–Final	GW contaminated with carbon tetrachloride	Not specified	GW pump and treatment using air stripping with discharge to either a GW recharge area or a public water supply system; installation of chloride monitoring wells near the coastline; and GW monitoring	GW cleanup levels will meet the MCL for carbon tetrachloride 5 ug/l	$2,200,000 - 6,200,000 (capital) $400,000 - 700,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Vega Alta, PR 09/29/87 1st	GW contaminated with VOCs including TCE and PCE	3,800,000 gpd (supply)	GW pump and treatment using scaling pretreatment, air stripping, and possibly activated carbon with discharge to creek or public distribution system; and the shutting down of two wells with connection to the public distribution system	GW pump and treatment will attain the 10^{-6} health-based risk level which includes MCL values for PCE 0.7 ug/l, 1,1,1-dichloroethene 0.23 ug/l, benzene 0.7 ug/l, and trichloroethene 2.8 ug/l. The ultimate attainment of MCLs will require identification and control of source(s)	$4,106,000 (capital) $581,000 (annual O&M)
II	Vestal Water Supply Well 1-1, NY 06/27/86 1st	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping; alternate water supply; and cessation of untreated discharge to river	Not specified	$389,400 (capital) $119,750 (annual O&M)
II	Volney Landfill, NY 07/31/87 1st	GW contaminated with VOCs and metals	4,000,000 yd^3	Supplemental capping of landfill side slopes covering approximately 35 acres; installation of a leachate collection system to include a slurry wall, collection wells, and force mains; and offsite or onsite treatment of contaminated leachate, which will be determined during design (flow equalization, batch biological treatment, and carbon absorption considered)	Cleanup goals will meet the MCL values for vinyl chloride 1.0 ug/l, benzene 5.0 ug/l, and arsenic 50.0 ug/l. Additionally, chloroform 0.0 ug/l, ickel 15.4 ug/l, and arsenic 0.0 ug/l will meet WQC values. Total phenols 1.0 ug/l will meet the NY State value	$12,754,000 (offsite treatment) (capital) $12,876,000 (onsite leachate treatment) (capital) $882,000 (offsite leachate treatment) (present worth O&M) $691,000 (onsite leachate treatment) (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
II	Waldick Aerospace, NJ 09/29/87 1st	Soil contaminated with VOCs including TCE, and inorganics	10,500 yd^3	In situ air stripping of 8,000 yd^3 from the saturated zone; excavation and offsite disposal of 2,500 yd^3 residuals with contamination above action levels; institutional controls to include site access and well restrictions; and fencing	Soil will be excavated to New Jersey Department of Environmental Protection levels which include cadmium 3.0 mg/kg, chromium 100.0 mg/kg, zinc 350.0 mg/kg,nickel 100.0 mg/kg, total VOCs 1.0 mg/kg, and total PHCs 100.0 mg/kg	$2,602,118 (capital) $55,000 (annual O&M)
II	Wide Beach, NY 09/30/85 1st-Final	GW and soil contaminated with PCBs	Not specified	Excavation and chemical treatment of PCB contaminated soil with backfilling of treatment residuals; offsite disposal of contaminated asphaltic material, and repavement of roadways and driveways; perched water treatment in sewer trench; construction of hydraulic barrier at end of sewer trench; conduction of treatability study to determine effective PCB and soil treatment; and sewage and sediments sampling	Based on 10^{-6} lifetime cancer risk, media cleanup goals include soil 10 mg/kg, air 1.67 ug/m^3, GW 100 ug/l, and SW 7.9 x 10^{-5} ug/l	$9,295,000 (capital) $0 (O&M)
II	Williams Property, NJ 09/29/87 1st-Final	Soil and GW contaminated with VOCs including PCE, organics, and metals	700 yd^3	Excavation of soil with removal to an offsite disposal facility for incineration; regrading, revegetation, and site restoration; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply to affected residences	Soil will be excavated to the New Jersey Environmental Cleanup Responsibility Act (ECRA) target level of 1.0 mg/kg total VOCs. GW will be treated to MCLs which include TCE 5.0 ug/l, chloroform 100.0 ug/l, barium 1,000.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$513,750 (capital) $64,600 (annual O&M)
II	York Oil, NY Waste Oil Recycling Facility 02/09/88 1st	Soil, sediments, GW, and SW contaminated with VOCs, metals, and organics including PCBs	30,000 yd^3 (soil) 8,000 yd^3 (sediments) 25,000 gals (tank contents)	Excavation and onsite solidification of soils and sediments followed by onsite disposal of treatment residuals; installation of draw down wells to collect sinking plume and oil followed by onsite oil skimmer and oil/water separator treatment with subsequent offsite discharge; offsite thermal treatment of tank oils in addition to other soils collected at the site; cleaning and demolition of empty storage tanks; and surface grading	GW cleanup will attain the State GW ARAR for any single phenolic compound 50 ug/l and for total phenolics 100 ug/l	$6,500,000 (capital) $500,000 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Aladdin Plating, PA Industrial Facility 09/27/88 1st	Soil contaminated with metals including chromium	12,000 yd^3	Excavation and offsite stabilization of contaminated soil, followed by offsite disposal in a landfill; and replacement of the excavated soil with clean fill	Soil cleanup will attain a level of chromium 50 mg/kg	$4,461,000 (present worth)
III	Ambler Asbestos Piles, PA Industrial Facility 09/30/88 1st	Sediments, SW, and debris contaminated with asbestos	4,500 yd^3 (sediments) 1,900,000 gals (SW) 1,255,000 yd^3 (debris)	Installation of a geotextile and soil cover over exposed areas of waste piles; erosion control/repair; vegetative/soil cover over both waste piles; runoff collection and treatment; pump and filter lagoon and basins water, followed by onsite discharge, backfilling lagoon and basins, and onsite disposal of collected sediments and asbestos onto the waste piles; slope stability control measures, if necessary after testing; further alternative evaluations; and access restrictions	Remedy addresses containment of asbestos-contaminated debris, therefore, no cleanup level is provided for the debris. SW treatment will meet requirements of State NPDES. Individual cleanup goal not specified	$5,135,000 (capital) $46,000 - $63,000 (years 2–6) $33,000 (years 7–30)
III	Army Creek Landfill, DE 09/30/86 1st	GW, SW, soil, and sediments contaminated with VOCs, inorganics, and metals	1,900,000 yd^3	Capping; downgradient GW pumping with monitoring; and possible upgradient controls	Not specified	$12,030,000 or $12,340,000 (upgradient controls) (capital) $306,000 or $388,000 (upgradient controls) (annual O&M)
III	Avtex Fibers, VA Industrial Facility 9/30/88 1st	GW is contaminated with organics including phenols and metals including arsenic and lead	Not specified	GW pump and treatment and basin liquid treatment after upgrading the existing onsite activated sludge treatment plant; GW, SW, and basin fluids monitoring; and deed restrictions	GW will be treated to meet MCLs, EPA Reference dose-based water limits, AWQC, State drinking water standards, NPDES requirements and Federal and State WQC. Individual cleanup goals include phenol 0.3 mg/l (AWQC), lead 0.05 mg/l (MCL/VAGWS), and arsenic 0.05 mg/l (MCL/VAGWS)	$9,122,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Bendix, PA Industrial Facility 09/30/88 1st-Final	Soil and GW contaminated with VOCs including TCE	Not specified	Soil vacuum extraction and soil aeration; and GW pump and treatment onsite with offsite GW treated at each residential wellhead	GW cleanup will attain a TCE concentration level of less than 1 ug/l both on- and offsite. Soil cleanup will meet a concentration limit of VOCs 100 ug/kg based on GW cleanup goal	$4,487,000 (present worth) $394,000 (annual O&M)
III	Berks Sand Pit, PA Waste Disposal Area 09/29/88 1st-Final	Sediments, SW and GW contaminated with VOCs including PCE, 1,1-DCE and 1,1,1-TCA	Not specified	Excavation of contaminated sediments with offsite incineration and disposal; GW pump and treatment using air stripping and vapor phase carbon adsorption, followed by reinjection to the aquifer; provision of an alternate water supply system; GW and SW monitoring; and deed restrictions	GW cleanup levels will meet MCLs for 1,1-DCE 7 ug/l and 1,1,1-TCA 200 ug/l. Secondary target levels of 1,1-DCE 1 ug/l and PCE 1 ug/l are based on Unit Cancer Risk. GW cleanup will also meet the Underground Injection Control Regulations	$10,773,100 (present worth) $459,200 (annual O&M)
III	Blosenski Landfill, PA 09/29/86 1st	GW, SW, and soil contaminated with PCBs, VOCs including benzene and TCE, inorganics, and pesticides	Not specified	Excavation and removal of buried drums and other materials with RCRA offsite disposal; alternate water supply; GW pumping with onsite treatment; capping with SW diversion and gas venting; and source reduction program	Removal of contaminated media will attain a 10^{-6} excess cancer risk. GW will initially be treated to ACLs, then to levels established by NPDES	$11,000,000-$15,000,000 ($13,000,000 (estimated baseline cost) (capital) $534,300 (annual O&M) (years 1-2)
III	Bruin Lagoon, PA 06/02/82 1st	GW, SW, and soil contaminated with asphalt sludge, acid liquids, waste oil, resins, fly ash, coal fires, sulphuric and sulfonic acids, and petroleum waste	Not specified	Removal and offsite disposal of liquid lagoon contents with physical stabilization of lagoons, effluent pond cleanup and dike stabilization; capping; and GW diversion	Not specified	$1,456,000 (capital) $60,000 (annual O&M)
III	Bruin Lagoon, PA 09/29/86 2nd-Final	Soils and bedrock contaminated with acidic sludges and metals	17,500 yd^3	Stabilization/neutralization of sludge and perched liquid zone; in situ bedrock treatment; and capping	Not specified	$2,695,000 (capital) $16,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Chisman Creek, VA 09/30/86 1st	GW, soil (disposal pits with fly ash), and SW contaminated with trace metals and inorganics	484,600 yd^3	Capping (2 pits); capping and upgradient GW diversion of one pit; alternate water supply; possible deed restrictions; and GW drainage and onsite treatment	Action for nickel complies with the AWQC for protection of fresh water aquatic life (88 ug/l - 280 ug/l) and salt water aquatic life (17 ug/l)	$14,119,000 (capital) $506,000 (annual O&M) (year 1) $64,000 (annual O&M) (years 2-30)
III	Chisman Creek, VA Waste Disposal Area 03/31/88 2nd-Final	SW contaminated with metals including nickel and vanadium	Not specified	Diversion of surface runoff from Area A (previously capped) into Pond A; and water quality monitoring	There is no ARAR promulgated for vanadium; however, an unpublished Estimated Advisory Concentration for vanadium of 7.7 ug/l will be met in fresh water systems. Remediation will attain the Clean Water Act level for nickel 13.4 mg/kg	$137,000 (present worth)
III	Delaware City PVC, DE 09/30/86 1st	GW, SW, and soil contaminated with VOCs including TCE	25,000 yd^3	Excavation and removal of contaminated soils and sludges with offsite disposal; capping; GW pumping and treatment; and alternate water supply	Recovery wells will operate until concentrations of VCM, EDC, and TCE reach 1 ug/l, 0.94 ug/l, and 2.7 ug/l, respectively, for two consecutive sample analyses	$1,904,000 (capital) $43,000 (annual O&M)
III	Delaware Sand and Gravel, DE 27-Acre Industrial Landfill 04/22/88 1st-Final	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs, PAHs, and phenols, and metals including chromium and lead	535,000 yd^3 (soil)	Excavation and onsite incineration of approximately 36,000 tons of contaminated soil and waste from the Drum Disposal and Ridge areas, followed by residual ash disposal offsite, grading, and revegetation of excavated areas; removal and offsite disposal of surface debris from the Inert area, followed by capping; construction of a RCRA cap over the Grantham South area; GW pump and treatment with offsite discharge; and GW monitoring	GW cleanup levels will attain 10^{-6} risk levels or MCLs at the site boundary, and meet NPDES requirements for SW discharge. Individual GW cleanup levels were not specified. Soil cleanup levels were based on acceptable drinking water exposure levels and include toluene 6,000 mg/kg, xylene 4.8 mg/kg, and phenol 497 mg/kg	$24,994,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Dorney Road Landfill, PA 27-Acre Municipal Landfill 09/29/88 1st	Soil and SW contaminated with VOCs, organics and inorganics	700,000 gals	Offsite disposal of ponded water; regrading and installation of a multi-layer cap; runon/runoff controls; runoff and GW monitoring; and access and deed restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable. Cancer risk levels onsite will be reduced to below 10^{-6}	$14,000,000 (present worth) $42,000 (annual O&M)
III	Douglassville, PA 09/27/85 1st	Soil and sediments contaminated with VOCs, pesticides, organics including PAHs and PCBs, and metals	Not specified	Removal and consolidadation of contaminated sediments from the drainage ditch, drainage swale, buried lagoon, and drum disposal areas, with onsite disposal under cap; capping former sludge lagoon area and sludge disposal area; installation of levees and dikes to protect from 100-year flooding event; and soil predesign study to determine extent of excavation and capping	Not specified	$5,569,500 (capital) $196,000 (annual O&M)
III	Douglassville Disposal, PA Waste Recycling and Processing Facility 06/24/88 2nd	Buildings, tanks, piping, and process equipment contaminated with VOCs, organics including PCBs and PAHs, and metals including lead	200,000 gals (tank contents)	Removal, transportation, and offsite incineration of liquid and sludge tank waste; decontamination of tanks, piping, processing equipment, and building materials; offsite disposal of building rubble; selling of tanks and other metal materials as scrap; offsite disposal of concrete, asphalt, and other materials; and treatment of generated decontamination fluids, as appropriate	Tasks, piping, processing equipment, and building materials designated for salvage or reuse will be decontaminated to a level not to exceed 100 ug/100 cm^2 PCBs on the surface. Concrete, asphalt, and other materials, which contain PCBs and cannot be decontaminated to less than 50 mg/kg PCBs, will be disposed of at an offsite hazardous waste landfill. This operable unit does not attempt to ensure compliance with all ARARs for the entire site, but will not be inconsistent with a final comprehensive remedy for the site	$4,050,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Drake Chemical, PA 09/30/84 1st	GW, SW, soil, and stream sediments contaminated with VOCs, pesticides, and inorganics	Not specified	Capping and grading of leachate stream; partial excavation and temporary onsite storage of contaminated sediments; and construction of conduit and a granular drain	Not specified	$445,311 (capital) $9,427 (annual O&M)
III	Drake Chemical, PA 05/13/86 2nd	GW, soil, sludges, buildings, and debris contaminated with organics and inorganics	3,900 yd^3 192,000 gals	Incineration of onsite chemicals; demolition and offsite removal of buildings, tanks, and debris; waste water pump and treatment of lagoons; metal recycling; and analysis with possible disposal of metal decontamination recycling fluid	Not specified	$3,143,000 (capital) $0 (O&M)
III	Drake Chemical, PA Industrial Facility 09/29/88 3rd-Final	Soil, sediments, GW, and SW contaminated with VOCs including benzene, toluene, TCE, and xylenes, organics including PAHs and phenols, and metals including arsenic, chromium and lead	252,000 yd^3 (soil, sediments, and sludge)	Excavation of soil, sediments and sludge, followed by onsite incineration, backfilling (possibly using incinerator ash), and installation of vegetation cover; GW pump and treatment along with SW, aqueous wastes from the leachate lagoon area, and runon, after construction of an onsite biological activated carbon treatment plant, followed by offsite discharge to a stream or POTW; GW monitoring; and flood control measures	GW cleanup levels will attain an overall risk level of 10^{-5} by meeting MCLs or MCLGs. Individual cleanup goals were not specified	$97,363,000 (present worth) $787,000 (annual O&M)
III	Enterprise Avenue, PA 05/10/84 1st-Final	SW and soil contaminated with VOCs, organics, and metals	Not specified	Offsite disposal of soils which fail key indicator parameter testing levels; backfilling of site with soils which passed parameter test; and grading and vegetating as a final cover	Not specified	$4,324,000 (capital) $4,200 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Fike Chemical, WV Industrial Facility 09/29/88 1st	Soil, GW, and SW contaminated with VOCs, organics including PCBs and methyl mercaptan, inorganics including acids, asbestos, cyanide, and metals	600,000 gals (SW) 750,000 gals (tank contents) 2,800 drums (liquid waste) 100,000 lbs (200 drums of metallic sodium)	Removal and offsite incineration of the tank containing methyl mercaptan and the drums of metallic sodium, followed by offsite disposal; removal, bulking, and offsite treatment and disposal of drums on the ground surface and of the materials found in various tanks, lines, and vessels (using incineration, ion exchange or chemical oxidation, and stabilization/fixation depending on contents); lab packing of laboratory containers with either offsite disposal or offsite incineration; drainage and stabilization of lagoon and sewage treatment ponds, followed by treatment and offsite residual discharge; excavation and offsite disposal of buried drums; and stabilization and/or removal of asbestos-containing insulation	Remedy addreses the control, stabilization, and elimination of the imminent hazards associated with the site to allow for the completion of the RI/FS process. Lagoon liquids will meet NPDES permit requirements. Individual goals were not specified	$8,000,000 (present worth)
III	Fischer & Porter, PA 05/04/84 1st-Final	SW contaminated with VOCs including TCE and PCE	Not specified	Improvements in manufacturing facility to prevent release; onsite installation of pumping wells and packed column aeration to reduce contaminant levels in effluents, with discharge to SW; and treatment of contaminated wells	Not specified	Not specified
III	Harvey-Knott, DE 09/30/85 1st-Final	GW, SW, and soil contaminated with VOCs, metals, organics including PCBs, and inorganics	Not specified	SW collection and treatment with offsite disposal; removal and offsite disposal of sediments, sludges, bulk wastes, drums, and debris; GW extraction and treatment with reinjection to soil for flushing; and site grading with 2 foot clean soil cover	Target soil and GW ACLs will be established during design	$3,572,000 (capital) $44,000 (annual O&M)
III	Heleva Landfill, PA 03/22/85 1st-Final	GW and SW contaminated with VOCs including TCE and PCE	Not specified	RCRA capping; SW diversion and gas venting systems; conduction of a predesign study to fully delineate the source of contamination and determine sink-hole activity; construction of an onsite treatment facility; GW pump and treatment; and extension of municipal water main to affected residents	GW will be treated to PCE 1.0 ug/l, TCE 1.8-5.0 ug/l, vinyl chloride 2.0 ug/l, 1,1,1-trichloroethane 21.7 ug/l, and toulene 15,000 ug/l	$7,791,000 (capital) $62,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Henderson Road, PA Waste Disposal Facility 03/30/88 1st	Potential offsite GW contamination from VOCs and organics	Not specified	Extraction of onsite and downgradient (if necessary) GW and treatment using air stripping with probable discharge to adjacent stream and possible reinjection of a portion of the GW near the injection well as part of unsaturated zone treatment; closure of the injection well; excavation of contaminated oil pit sediments and removal of significant waste, if feasible, directly out of the injection well; installation, operation, and maintenance of a carbon adsorption water treatment system at affected offsite active well; deed restrictions; GW monitoring; pilot study testing of in-situ volatilization (ISV) or other technology in the unsaturated zone; and periodic reevaluation of cleanup goals	GW cleanup will attain a 7 x 10^{-4} cancer risk level. Complete aquifer restoration not considered feasible due to background contamination. Individual cleanup goals provided for 46 chemicals	$5,500,000 (without ISV) (present worth) or $12,200,000 (with ISV) (present worth)
III	Industrial Lane, PA 09/29/86 1st	GW contaminated with VOCs	Not specified	Provision of alternate water supply; and possible GW usage restrictions	Not specified	$30,800 (capital) $0 (O&M)
III	Kane and Lombard, MD 09/30/87 1st	Soil, GW, and debris contaminated with VOCs, organics including PAHs and PCBs, and metals	67,000 yd^3	Removal of drums, hot spots, and 67,000 yd^3 soil with onsite soil capping; construction of subsurface containment/diversion system; development of SW run-off management facility; and future use of institutional controls	Chemical-specific cleanup levels will be addressed in 2nd O.U.	$4,692,660 (capital) $28,930 (annual O&M)
III	Kimberton, PA Industrial Facility 09/30/88 1st	GW contaminated with VOCs including TCE	Not specified	Interim remedy selects no further action with continued GW monitoring and treatment at residential and commercial establishments by filtration using granular activated carbon adsorption	GW treatment will attain a 10^{-6} risk level for VOCs. The use of GAC filters on impacted wells has reduced contaminants of concern to non-detectable levels	$3,850,000 (present worth) $250,000 - $300,000 (annual O&M)
III	Lackawanna Refuse Site, PA 03/22/85 1st-Final	SW and soil contaminated with VOCs, organics, and metals	Not specified	Excavation and offsite disposal of drums and highly contaminated fill; leachate collection and surface drainage diversion; clay capping and construction of gas venting systems; and reconstruction of access road	Excavation limits will be determined by background contaminant levels	$8,200,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	L.A. Clarke and Son, VA Industrial Facility 03/31/88 1st	Soil and sediments contaminated with constituents of creosote including PNAs and benzene	118,000 yd^3	In situ soil flushing of subsurface soils followed by in situ biodegradation; onsite land farming of excavated surface soils, sediments, and subsurface wetland soils; biological degradation of creosote contaminated bottom sediment; excavation/dredging and consolidation of nontreated contaminated sediments, subsurface wetland soils, buried pit materials and remaining surface soils; erosion sedimentation control; backfilling of excavated areas with treated soil and sediments and addition of topsoil for revegetation; and GW monitoring	Soil cleanup levels will attain a cumulative 10^{-5} cancer risk level. Individual goals include carcinogenic PNAs 10.3 mg/kg and benzene 94.03 mg/kg	$23,409,000 (present worth) $33,900 (present worth O&M)
III	Lansdowne Radiation, PA 08/02/85 1st	Dwellings contaminated with radioactive materials including radium	Not specified	Permanent relocation of residents	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/g	$1,500,000 (capital) $10,000 (annual O&M)
III	Lansdowne Radiation, PA 09/22/86 2nd	Dwellings and soil contaminated with radioactive materials including radium	Not specified	Demolition and offsite disposal of two homes; and excavation and offsite disposal of contaminated soil	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/g	$4,000,000 - $4,500,000 (capital) "Minimal" (O&M)
III	Leetown Pesticide, WV 03/31/86 1st-Final	Soil and debris contaminated with pesticides	3,600 yd^3	Excavation, consolidation, and anaerobic biodegradation of contaminated soil; and removal and offsite disposal of contaminated debris	Target soil levels for DDT and its metabolites is 300 ug/kg, which is equivalent to the 10^{-6} carcinogenic risk level	$1,014,000 (capital) $10,000 (annual O&M) (year 1) $7,500 (annual O&M) (year 2)
III	Lehigh Electric, PA 02/11/83 1st-Final	Soil contaminated with VOCs and PCBs	Not specified	Excavation and removal of contaminated soil, transformers, and debris with offsite disposal of soil; demolition of onsite buildings; and backfilling, grading, and vegetation of site to minimize erosion and control runoff	Offsite disposal of soils with PCB concentration >50 mg/kg	$6,401,000 (capital) $46,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Limestone Road, MD 09/30/86 1st	Soils, GW, SW, and sediment contaminated with VOCs including TCE and PCE, and metals	Not specified	Capping with grading and fencing	Not specified	$1,192,580 (capital) O&M (to be determined)
III	Matthews Electroplating, VA 06/02/83 1st-Final	GW and soil contaminated with metals including chromium	Not specified	Extension of existing municipal water system to affected residents	Not specified	$662,000 (capital) $292,000 (annual O&M)
III	McAdoo, PA 06/05/84 IRM	GW and soil contaminated with organics and inorganics	Not specified	Cleaning and removal of underground waste storage tanks; excavation and offsite disposal of visibly contaminated soil; and evaluation of analytical results of soil analyses	Not specified	$114,500 (capital) $0 (O&M)
III	McAdoo Associates, PA 06/28/85 2nd	GW, SW, and soil contaminated with paint sludges, spent solvents, metallic sludges, acid and caustic liquids, toluene, waste oil/water, and solid waste	Not specified	Removal and offsite disposal of the onsite tank, debris, and contaminated soil; limited excavation of soil; RCRA capping; SW diversion; and site covering	Excavation of soil "hot spots" which exceed cadimum 0.2 ug/kg, chromium 809 ug/kg, and cyanide 33 ug/kg	$2,360,000 (capital) O&M (not provided)
III	Middletown Road, MD 03/17/86 1st-Final	No threat	None	No action	Not specified	$0 (capital) $0 (O&M)
III	Middletown Airfield, PA Federal Facility 12/31/87 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Provision of a potable water supply; construction of a central treatment plant; and GW pump and treatment using air stripping	GW cleanup levels will meet a cumulative 10^{-6} cancer risk level for PCE 1.0 ug/l, and MCLs for TCE 5.0 ug/l, benzene 5.0 ug/l, and toluene 2,000 ug/l (MCLG)	$3,750,000 (capital) $160,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Millcreek Dump, PA 05/07/86 1st-Final	Soils, sediments, and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and metals	Not specified	Excavation and onsite consolidation of soils under a RCRA cap with site grading and revegetation; soil capping over remaining soil; SW management; GW pump and treatment; and flood retention system	Soil cleanup goals include PCBs 10 mg/kg, PAHs 2,940 ug/kg, TCE 10 ug/kg, phenols 9,000 ug/kg, and toluene 1,783 ug/kg	$12,000,000 $18,000,000 ($15,000,000 estimated base-line) (capital) $1,763,000 (present worth O&M)
III	Moyer Landfill, PA 09/30/85 1st-Final	GW and SW contaminated with metals, VOCs including TCE, arsenic, and radioactive materials	Not specified	Soil/clay capping; erosion and sedimentation control measures; SW diversion; leachate collection, treatment, and discharge; methane gas recovery and sale; security/fencing measures; and RCRA closure	Not specified	$6,293,500 (capital) $332,000 (annual O&M)
III	New Castle, DE Waste Disposal Facility 03/31/88 1st-Final	None	None	No action with SW monitoring until deletion from NPL and implementation of State Closure	Concentrations of lead, cadmium, and chromium are below levels established as MCLs	$0
III	Ordnance Works Disposal, WV Waste Disposal Area 03/31/88 1st	Soil and sediments contaminated with metals including arsenic, and organics including PAHs and PCBs	Not specified	Consolidation of existing landfill waste and application of a multi-layer RCRA cap; excavation and onsite incineration of lagoon area and scraped-area soils and impacted stream sediments with onsite disposal of treatment residuals in the landfill prior to capping (assuming the ash is not EP toxic); placement of clean fill in the excavated area, followed by grading and revegetation; implementation of surface management techniques for drainage and sediment control in the landfill area; and ambient air and post-treatment monitoring	Risk-based cleanup levels for indicator chemicals were developed for arsenic 20 mg/kg, PAHs 26 mg/kg, and mercury 175 mg/kg. A PCB cleanup level of 5 mg/kg was used based on EPA cleanup goals for industrial sites	$6,718,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Palmerton Zinc, PA 09/04/87 1st	Defoliation of mountain side from zinc, lead, cadmium, and sulfur dioxide	Not specified	Onsite installation of concrete pad with berms to mix offsite sewage sludge and fly ash; application of lime (10 tons/acre) and potash (80 lbs/acre) on target areas; application of fly ash and offsite sludge on target areas; and application of grass seed, seedlings, and mulch	State loading rates for metals include cadmium 3.0 lbs/acre, copper 100.0 lbs/acre, chromium 100.0 lbs/acre, lead 100.0 lbs/acre, mercury 0.3 lbs/acre,nickel 20.0 lbs/acre, and zinc 200.0 lbs/acre. The maximum dry sludge application rate is 60 tons/acre	"Minimal" to none
III	Palmerton Zinc, PA Industrial Facility/Zinc Smelter 06/29/88 2nd	Sediments, GW, and SW contaminated with metals including cadmium, lead, and zinc	27,500,000 tons (smelter process residues)	Slope modification, capping, and application of a vegetation cover on the residue bank; construction of SW diversion channels; SW/leachate collection and treatment using lime-activated filtration lagoons and/or constructed wetlands; implementation of an inspection, monitoring, and maintenance plan; and wetlands restorative measures, if necessary	SW/leachate treatment levels will meet CWA requirements and attain SW background levels. Individual goals were not specified	>$2,861,000 (present worth) (exact figure to be determined during design)
III	Presque Isle, PA 09/30/87 1st-Final	None	Not applicable	No further action	Not specified	$0
III	Rhinehart Tire Fire, VA Waste Disposal Facility 06/30/88 1st	Soil, GW and SW contaminated with metals including arsenic, lead and zinc	Not specified	Collection and gravity settling of surface water runoff; collection, oil-water separation and transport to POTW of shallow GW oily seeps; increased freeboard in existing onsite ponds; and soil erosion control	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$1,332,340 (present worth) $145,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Saltville Waste Disposal Ponds, VA 06/30/87 1st	Soil, sediments, SW, air, and biota contaminated with mercury	Not specified	Upgrading runon controls; treatment of waste pond outfall with either sulfide precipitation or carbon adsorption; and institutional controls to include possible implementation of local zoning ordinances	Treated effluent discharged into river will meet the State standard for mercury 0.05 ug/l in water	$840,052 - $2,143,052 (capital) $221,941 - $258,941 (sulfide ppt. or carbon system, respectively) (annual O&M)
III	Sand, Gravel & Stone, MD 09/30/85 1st	GW, SW, soil, and sediments contaminated with organics and metals	Not specified	Excavation and offsite disposal of hazardous materials; and GW extraction and treatment with discharge to ponds, aquifer, or creek	GW will be treated to background levels for heavy metals and organic compounds	$7,095,000 (capital) $753,000 (annual O&M)
III •	Southern MD Wood Treating, MD Wood Preserving Facility 06/29/88 1st-Final	Soil, sediments, SW, GW, and debris contaminated with VOCs, and organics including PNAs	102,000 yd^3 (soil and sediments)	Excavation/dredging of soils, sediments, cement, and tank liquids and treatment using onsite incineration with onsite disposal of residual ash, backfilling, regrading, and revegetating, where necessary; installation of a slurry wall; GW and SW pump and treatment using activated carbon adsorption of hydrogen peroxide and UV irradiation with discharge to the onsite pond; installation of a geotextile silt fence, sedimentation basins, and/or diversion/surface management; and GW, SW, environmental, organic vapor, and dust monitoring	All media will attain the cleanup goal for carcinogenic PNAs (CPNAs) of 2.2 ppm based on the maximum lifetime cancer risk. These goals were established for onsite future residents. The ash residue is expected to meet Best Demonstrated Available Technology	$38,163,000 (present worth) $44,000 (O&M present worth)
III	Taylor Borough, PA 06/28/85 1st	SW, soil, and sediments contaminated with VOCs including TCE, and organics	Not specified	Removal and offsite disposal of drums and remnants; SW collection and treatment; excavation and offsite disposal of contaminated soil, waste, and sediments from two of the former drum storage areas (areas 1 & 2) with backfilling and placement of a 24-inch soil cover over the remaining three former drum storage areas; and fencing	Excavation of sediments, soils, and wastes to background levels	$4,237,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Taylor Borough, PA 03/17/86 2nd-Final	Possible GW contamination with VOCs and metals	Not specified	No further action with semi-annual GW monitoring	Not specified	$0 (capital) $8,000 or $16,000 (annual O&M)
III	Tybouts Corner Landfill, DE 03/06/86 1st-Final	Soils and GW contaminated with VOCs including TCE, and inorganics	Not specified	Excavation of waste and soils with onsite consolidation and capping; and GW pump and treatment	GW will be treated to the cancer risk of 10^{-4} for carcinogens, which includes TVO 100 ug/l	FS estimate: $35,000,000 (capital) PRP estimate: $15,000,000 (capital) $4,600,000 (present worth O&M)
III	Tyson's Dump, PA 12/21/84 1st	GW, SW, soil, and stream sediments contaminated with VOCs	Not specified	Excavation and offsite disposal of contaminated soils and wastes; upgrading of the existing air stripping facility to treat leachate, shallow GW, and surface run-on; and excavation and offsite disposal of contaminated sediments	Not specified	$5,718,000 (capital) $351,000 (annual O&M)
III	Tyson's Dump, PA Waste Disposal Facility 09/30/88 2nd-Final	GW contaminated with VOCs including toluene 1,2,3-trichloropropane, and xylenes	Not specified	GW pumping and treatment using air stripping and vapor-phase carbon, and if necessary, GAC polishing of air-stripped water with offsite discharge of treated water; and GW monitoring	GW cleanup levels include toluene 2.0 mg/l, 1,2,3-trichloropropane 0.00035 mg/l, and xylenes 0.12 mg/l based on 10^{-6} risk level, MCLs, and WQC	$6,170,000 - $6,910,000 (present worth) $424,300 - $509,900 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	Tyson's Dump, PA Waste Disposal Disposal Facility 03/31/88 Addendum to 12/21/84 ROD	Soil and bedrock contaminated with VOCs	Not specified	In situ treatment of soil and bedrock using vacuum extraction; treatment of vacuum-extracted water using the onsite leachate water treatment system; and installation of a soil cover following treatment	Cleanup levels were developed using health-based acceptable intake levels and hypothetical exposure scenarios. The scenario producing the most stringent cleanup requirement was selected as the cleanup goal. Individual cleanup goals were listed for 45 contaminants. Cleanup levels for indicator compounds include benzene 50 ug/kg, trichloroethane 50 ug/kg, PCE 50 ug/kg, and 1,2,3-trichloropropane 50 ug/kg	$10,200,000 (present worth)
III	Voortman Farm, PA Waste Disposal Facility 06/30/88 1st-Final	GW monitored for contamination from metals including lead and cadmium	Not specified	No action alternative with continued GW monitoring	Currently, the GW does not violate drinking water standards	$26,010 (present worth) $6,860 (annual O&M)
III	Wade, PA 08/30/84 1st-Final	Soil contaminated with organics, metals, and inorganics	Not specified	Removal and offsite disposal of contaminated soil, tires, tankers, waste piles, and underground storage tanks; demolition of buildings, leveling of debris, filling and grading of property; and top soil and seed capping	Not specified	$1,580,050 (capital) $320,000 (annual O&M)
III	West Virginia Ordnance Works, WV 03/27/87 1st	Soil, sediments, and SW line contaminated with organics and asbestos	4,305 yd^3	In-situ flaming treatment of reactive nitroaromatic residue; capping of treatment residuals with nitroaromatic concentrations >50 mg/kg; excavation, flushing, and backfilling of reactive sewer lines; offsite disposal of asbestos; and institutional controls to include deed restrictions	Soil cleanup will attain less than the 10^{-6} individual lifetime cancer risk level. This sets the cleanup goal of total nitroaromatics at 50.0 mg/kg	$1,807,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
III	West Virginia Ordnance Works, WV Industrial Facility 09/30/88 2nd-Final	Soil, sediments, and GW contaminated with nitroaromatics and lead	Not specified	Remedy addresses three distinct areas of contamination. Area 1 - GW pump and treatment with discharge to SW; purchase land, construct a soil cover over the contaminated area, and incorporate land into existing wildlife preserve Area 2 - Relocation of ponds 1 and 2, followed by backfilling with clean fill; and GW pump and treatment with discharge to SW Area 3 - Installation of a soil cover; and GW pump and treatment with discharge to SW	GW goals are based on available standards or a 10^{-6} cancer risk. GW cleanup goals were provided for six contaminants including TNT 50 ug/l	$3,365,000 (present worth) $216,500 (O&M)
III	Westline Site, PA 07/03/86 1st-Final	Soils contaminated with tars containing phenols and PAHs	710 yd^3	Excavation and offsite incineration of tar deposits; backfilling with clean soil; and GW verification study	Soils will be excavated to a 10^{-4} cancer risk level for contaminants present onsite, which is consistent with the 10^{-6} risk level for GW	$744,000 (capital) $0 (O&M)
III	Westline, PA Wood Processing Facility 06/29/88 2nd-Final	GW contaminated with VOCs including benzene, and organics	Not specified	No action with continued GW monitoring; and implementation of institutional controls to prevent the addition of new drinking water wells	The remedy meets the 8.93 x 10^{-5} increased cancer risk level. Natural attenuation can meet the MCL for benzene 5.0 ug/l within a 5 to 10-year period. Additionally, WQC and standards have not been exceeded	$0 (capital)
III	Wildcat Landfill, DE 44-Acre Industrial/ Municipal Landfill 06/29/88 1st	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs and metals including arsenic	160 drums (waste material)	Removal and offsite disposal of drums and drum contents with offsite disposal by landfilling, if not hazardous, or incineration, if hazardous; grading, soil cover, and revegetation of direct contact risk areas; replacement of two domestic wells adjacent to the site; GW monitoring; and institutional controls including well and land use restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$5,400,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Airco, KY 2.7-Acre Industrial Landfill 06/24/88 1st-Final	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, EDC, PCE, and TCE, organics including PAHs and PCBs, and inorganics	5,000 yd^3 (soil) 6,075,000 ft^3 (GW) (includes volume from Goodrich, B.F. site)	Excavation of contaminated soil with placement in pit area located on the adjacent B.F. Goodrich NPL site property, cover pit with a RCRA cap, and construct an organic vapor recovery system to separate VOCs from soil; construction of a flood protection dike; installation of a leachate extraction system around landfill and upgrading of the existing landfill clay cap; GW pump and treatment using air stripping with discharge to the river; and implementation of institutional controls including deed restrictions	GW will be treated to meet ACLs. Individual ACL goals were calculated using a multiplier and MCLs or AWQCs. Individual goals include EDC 8.5 mg/l, TCE 8.5 mg/l, PCE 1.5 mg/l, and benzene 8.5 mg/l. Soil cleanup levels will attain an EDC level of 139 mg/kg based on the allowable EDC GW concentration	$2,960,000 (capital) $3,130,000 (present worth O&M) (combined with costs from Goodrich, B.F. site)
IV	Alpha Chemical, FL Industrial Facility 05/18/88 1st-Final	GW contaminated with low-level organics	Not specified	Capping of the small unlined pond; and long-term GW and SW monitoring	Recommended AWQC are currently met for all wells at the property line and immediately downgradient of all site areas except the unlined pond. Capping will manage the threat of future releases from the pond area and meet AWQC for ethylbenzene 1.4 mg/l, and 1,2-dichloropropane 1.4 mg/l downgradient of the unlined pond	$142,400 (capital) $186,200 (present worth O&M)
IV	A.L. Taylor, KY 06/18/86 1st-Final	Soils, sediments, and SW contaminated with VOCs, PCBs, PAHs, and metals	Not specified	Excavation of soils, sediments, and sludge with onsite containment and capping	Not specified	$795,349 (capital) O&M (not provided)
IV	American Creosote, FL 09/30/85 1st	Soil contaminated with aromatic hydrocarbons	Not specified	Excavation and consolidation of contaminated soil from areas both on and off the site in an onsite RCRA landfill	Excavation of soils and sludges to MCLs including PAHs 12.0 mg/kg and benzene 0.13 mg/kg	$5,678,000 (capital) $50,000 (annual O&M) (years 1-5) $19,000 (annual O&M) (years 6-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Biscayne Aquifer Site, FL 09/16/85 1st-Final	GW contaminated with VOCs	Not specified	Addition of air stripping to existing water treatment system; and operation of Miami Spring and Preston municipal wells	Cleanup goals based on EPA primary drinking water standards and the 10^{-6} cancer risk level have been identified for 50 priority pollutants	$5,268,000 (capital) $334,400 (annual O&M)
IV	Brown Wood Preserving, FL Wood Preserving Facility 04/08/88 1st-Final	Soil, sediments, sludge, and wastewater contaminated with creosote constituents including PAHs	3,000 yd^3 (creosote sediments/ sludge)	Removal, treatment (if necessary), and discharge of lagoon water to a POTW; excavation, treatment, and offsite disposal of 1,500 tons of the most severely contaminated soil/sludge; onsite biodegradation of approximately 10,000 tons of the remaining soils in a 14-acre treatment area constructed with a liner and an internal drainage and spray irrigation system; covering of treatment area with clean fill after bioremediation; and GW monitoring	Cleanup levels will meet a 10^{-6} health-based risk level accomplished by reducing the concentration of total carcinogenic indicator PAH compounds to 100 mg/kg throughout the volume of the material treated	$2,740,000 (present worth)
IV	Celanese Fibers Operations, NC Industrial Facility 03/23/88 1st	GW contaminated with VOCs including benzene and PCE, organics including phenols, and metals including chromium	Not specified	GW pump and treatment onsite using air stripping, biological treatment, and carbon adsorption (if necessary), followed by discharge to the onsite wastewater treatment plant	GW cleanup will attain Federal or State MCLs, whichever is more stringent. Individual cleanup goals were not specified	$2,032,000 (present worth) $1,069,230 (present worth O&M)
IV	Chemtronics, NC Waste Disposal Facility 04/05/88 1st-Final	Soil and GW contaminated with VOCs, organics, metals, pesticides, and explosives	Not specified	Multi-layer capping of 5 disposal areas with fencing, placement of a vegetative cover over the cap, and installation of a gas collection/ventilation system, if necessary; treatability studies for soils associated with Disposal Area 23 to determine the most appropriate soil fixation/stabilization/ solidification process and mixing ratios followed by onsite capping; GW pump and treatment which may include air stripping, carbon adsorption, or metal removal with discharge and treatment to be determined during design; and sediment, GW, and SW monitoring	GW cleanup levels were based on MCLs and several TBCs. Some individual goals include: TCE 0.005 mg/l, benzene 0.005 mg/l, PCE 0.007 mg/l, toluene 2.0 mg/l, RDX 0.035 mg/l, TNT 0.044 mg/l, lead 0.05 mg/l, and chromium 0.05 mg/l. Some individual soil cleanup goals include: PCBs 10 mg/kg, RDX 95 mg/kg, TNT 305 mg/kg, and CS 43.3 mg/kg	$6,247,300 - $8,242,900 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Coleman Evans, FL 09/25/86 1st-Final	GW, soil, and sediments contaminated with VOCs, organics including PCP, and metals including chromium	9,000 yd^3	Excavation of PCP contaminated soils and sediments with onsite incineration; backfilling with decontaminated soil; GW recovery, storage and analysis; possible onsite GW treatment using carbon adsorption with discharge to surface	All soils containing PCP in excess of 10 mg/kg will be excavated. GW will be treated to levels which comply with Drinking Water Standards or Water Quality Criteria	$3,000,000 - $3,800,000 (capital) $0 (O&M)
IV	Davie Landfill, FL 09/30/85 1st	GW and sludge lagoon contaminated with organics, and inorganics including cyanide and sulfide	75,000 yd^3	Dewatering and stabilization of sludge lagoon contents and placement in single lined cell; and capping	Cleanup goals prevent exceedance of drinking water standards or the 10^{-6} cancer risk level	$3,000,000 - $3,700,000 (capital) $100,000 (annual O&M)
IV	Distler Brickyard, KY 08/19/86 1st-Final	GW and soils contaminated with VOCs including TCE, metals, and inorganics	8,000 yd^3	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soils; and GW pump and offsite treatment at POTW with reinjection into the aquifer	GW will be treated and soil will be excavated to background levels	$7,500,000 (present worth) $1,568,000 (annual O&M) (years 1-2) $44,000 (annual O&M) (years 3-30)
IV	Distler Farm, KY 08/19/86 1st-Final	GW and soils contaminated with VOCs including TCE and PCE, metals, and inorganics	Not specified	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soil; and GW pump and offsite treatment at POTW with reinjection of uncontaminated water into the aquifer	GW will be treated and soil will be excavated to background levels	$11,138,400 (capital) $113,600 (annual O&M) (years 1-10) $20,000 (annual O&M) (years 11-30)
IV	Flowood, MS Industrial Area 09/30/88 1st-Final	Soil and sediments contaminated with lead	6,000 yd^3	Excavation and stabilization/solidification of contaminated soil and sediments, followed by backfilling and capping with clean fill, as necessary; and GW monitoring	Soil and sediments cleanup levels will attain lead 500 mg/kg, a risk-based level	$2,000,000 (present worth) $25,000 (O&M, year 1)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Gallaway Ponds, TN 09/26/86 1st-Final	Pond sediments contaminated with pesticides and inorganics	1,600 yd^3	Excavation of sediments with onsite consolidation; RCRA site closure; pond water dilution with discharge to tributary; and institutional controls	Pond water dilution will meet Ambient Water Quality Criteria	$344,735 (capital) $163,265 (present worth O&M)
IV	Geiger (C&M Oil), SC 03/27/87 1st	Soil and GW contaminated with VOCs, organics including PCBs, and metals	11,300 yd^3 62,000,000 gals	Excavation and onsite thermal treatment of soil followed by solidification/ stabilization with backfilling of excavated areas using grading and covering; and GW pump and treatment with discharge to SW	Specific preliminary goals for soil based on MCLs to include lead 166.5 mg/kg, chromium 3.7 mg/kg, benzene 14.4 mg/kg, trans-1, 2-dichloroethylene 76.0 ug/kg, toluene 971.0 ug/kg, and PCB (Aroclor 1254) 1,050 ug/kg. GW will attain the cumulative 10^{-5} cancer risk level which includes MCL values for benzene 5.0 ug/l, toluene 175.0 ug/l, and lead 50.0 ug/l	$6,917,000-$7,693,400 (present worth) $367,200 (present worth O&M)
IV	Gold Coast, FL 09/11/87 1st-Final	Soil and GW contaminated with VOCs including TCE and PCE, and metals	1,500 yd^3 100,000 gals	Stabilization/solidification of 1,000 yd^3 metal contaminated soil with onsite disposal and capping; excavation of 500 yd^3 soil and sludges with offsite disposal at a RCRA facility; GW pump and treatment (to be identified during design) with offsite discharge; and well closure	Soils will be excavated to the 10^{-4} health-based risk level which includes lead 100.0 mg/kg. GW treatment will attain MCLs for VOC contamination which include 1,1-dichloroethane 5.0 ug/l, methylene chloride 5.0 ug/l, trans-1,2-dichloroethylene 70.0 ug/l, tetrachloroethylene 3.0 ug/l, toluene 340.0 ug/l, and trichloroethylene 3.0 ug/l	$3,711,660 (capital) $74,850 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Goodrich, B.F., KY (RI/FS prepared as B.F. Goodrich/Airco site) 1-Acre Industrial Landfill 06/24/88 1st-Final	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, EDC, PCE and TCE, organics including PAHs, and PCBs and inorganics	5,000 yd^3 (soil) 6,075,000 ft^3 (GW) (includes volume from Airco, KY site)	Excavation of contaminated soil with placement in pit area, cover with a RCRA cap and construct an organic vapor recovery system to separate VOCs from soil; construction of a flood protection dike; installation of a leachate extraction system around landfill and upgrading of the existing landfill clay cap; GW pump and treatment using air stripping with discharge to the river; and implementation of institutional controls including deed restrictions	GW will be treated to meet ACLs. Individual ACL goals were calculated using a multiplier and MCLs or AWQCs. Individual goals include EDC 8.5 mg/l, TCE 8.5 mg/l, PCE 1.5 mg/l, and benzene 8.5 mg/l. Soil cleanup level will attain an EDC level of 139 mg/kg based on the allowable EDC GW concentration	$2,960,000 (capital) $3,130,000 (present worth O&M) (combined with costs from Airco, KY site)
IV	Hipps Road Landfill, FL 09/03/86 1st-Final	GW contaminated with VOCs including TCE, and metals	Not specified	GW pump and treatment at POTW; RCRA Subtitle D landfill closure; and institutional controls	GW will be treated to meet SDWA requirements, Water Quality Criteria Human Health Standards, or the 10^{-6} cancer risk	$3,900,000-$4,400,000 (capital) O&M (not provided)
IV	Hollingsworth, FL 04/10/86 1st-Final	GW and soil contaminated with VOCs including TCE	Not specified	Excavation, aeration and onsite replacement of VOC contaminated soil; and GW pump and treatment with reinjection into the aquifer	GW cleanup goals will be based on the 10^{-6} cancer risk level and State Drinking Water Standards	$653,730 (capital) $364,215 (annual O&M)
IV	Independent Nail, SC 09/28/87 1st	Soil and sediments contaminated with metals	6,200 yd^3	Excavation of metal contaminated soil and lagoon sediments with solidification/stabilization; backfilling of treated soil; and covering	Soil will attain a 10^{-6} or less, cancer risk level which includes cadmium 2.6 mg/kg, chromium 5.3 mg/kg, cyanide 0.02 mg/kg, nickel 18.0 mg/kg, and zinc 1,785.0 mg/kg	$1,032,000 (capital) $22,500 (annual O&M) (years 1-2) $5,600 (annual O&M) (years 3-30)
IV	Independent Nail, SC Industrial Facility 08/30/88 2nd-Final	GW contaminated with metals including chromium	Not applicable	No action remedy	GW poses no threat, thus individual cleanup goals are not applicable	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Lees Lane Landfill, KY 09/25/86 2nd-Final	GW, SW, and soil contaminated with VOCs, metals, and inorganics	212,400 tons	Removal of exposed drums and offsite disposal; capping of hot spots and exposed trash areas; gas collection and venting system; possible alternate water supply; bank stabilization; and institutional controls	ACLs will be developed from GW monitoring data	$2,343,000 (capital) $127,440 (annual O&M)
IV	Miami Drum Services, FL 09/13/82 1st	GW and soil contaminated with organics, pesticides, and metals	Not specified	Excavation and offsite disposal of soil; and treatment of GW encountered during excavation	Not specified	$1,568,660 (capital) $0 (O&M)
IV	Mowbray Engineering, AL 09/25/86 1st-Final	Swamp soils contaminated with PCBs	4,800 yd^3	Excavation of PCB-contaminated soil with either onsite incineration, offsite incineration, or solidification/stabilization of the waste	Soils with 25 mg/kg PCBs or greater will be excavated and treated	$1,200,000 - $2,000,000 (offsite incineration) (present worth) $1,100,000 - $1,800,000 (onsite incineration) (present worth) $750,000 (solidification/stabilization) (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	National Starch and Chemical Corporation, NC Industrial Plant 09/30/88 1st	GW, SW, and sediments contaminated with VOCs including benzene, TCE, toluene and xylenes, and metals including chromium	Not specified	Installation of a GW interception and extraction system downgradient of the source areas with pretreatment including air stripping, filtration through an activated carbon filter, metal removal, or treatment through existing lagoon system which includes presettling and surface aeration; and SW and sediment monitoring. If the POTW declines to accept the treated GW, it will be discharged to a local stream under a NPDES permit	GW cleanup goals were provided for the 25 chemicals of concern and will meet MCLs, if available. If an MCL is not available, the cleanup goal for a carcinogen is set at the limit of detection; and for a noncarcinogen, at the RfD or ACI equivalent level. However, ethyl benzene will meet the proposed MCLG. Individual cleanup goals include: arsenic 10 ug/l (MCL), benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), chromium 2,000 ug/l (MCL), and xylenes 340 ug/l (MCL)	$3,036,000 (present worth) $55,000 (annual O&M)
IV	Newport Dump, KY 03/27/87 1st	Soil and GW contaminated with organics including PCBs and PAHs, and metals	1,000,000 yd^3	Implementation of multimedia monitoring program; restoration and extention of leachate collection system; and restoration, regrading, and bank stabilization of existing clay cap with revegetation	PCBs, nickel, toluene, and other organics will be treated to the 10^{-6} health-based risk level. Barium and chromium will attain the MCL values of 1,000.0 ug/l and 50.0 ug/l, respectively	$516,000 (capital) $63,000 (annual O&M) (years 1-2) $35,000 (annual O&M) (years 3-30)
IV	N.W. 58th Street Landfill, FL 09/21/87 3rd-Final	GW contaminated with VOCs including TCE and PCE, and metals	27,000,000 yd^3	Landfill closure for all contaminated soil; controlling leachate generation through grading, drainage control, and capping; and provision of an alternate water supply to private well users east of landfill	The GW remedial action, as required in the 1985 ROD, will provide air stripping to bring contaminants into compliance with MCLs	$5,500,000 (present worth) $1,500,000 (O&M) (present worth O&M)
IV	Palmetto Wood Preserving, SC 09/30/87 1st-Final	Soil and GW contaminated with metals	19,895 yd^3 10,500,000 gals	Excavation of contaminated soil with onsite flushing and backfilling of treated soil; pumping of wastewater to onsite treatment facility; GW pump and treatment with offsite discharge to SW; and installation of municipal waterline to affected residents or the drilling of new wells	Soil cleanup will attain public health evaluation levels which include chromium 627.0 mg/kg and arsenic 200.0 mg/kg. GW will attain MCL values which include chromium 50.0 ug/l, copper 1,000.0 ug/l, and arsenic 50.0 ug/l	$1,393,000 (capital) $176,163 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Parramore Surplus, FL 09/15/87 1st-Final	Possible contamination of GW with metals	Not applicable	No further action with monitoring of GW and SW	Cleanup standards to be reviewed as part of GW quality assessment include MCLs and WQC	$21,000 (capital) $19,000 (annual O&M)
IV	Pepper's Steel, FL 03/12/86 1st-Final	GW, soil, and sediments contaminated with organics including PCBs, and metals	PCB>1 mg/kg, approximatly 48,000 yd^3; lead > 1000 mg/kg, 21,500 yd^3; arsenic > 5 mg/kg, 9,000 yd^3 (waste quantities not additive)	Excavation, solidification/stabilization, and onsite disposal of soil; collection and offsite disposal of free oil; and land use institutional controls	Excavation of soil exceeding PCB 1 mg/kg, lead 1000 mg/kg, and arsenic 5 mg/kg	$5,212,000 (capital) $42,500 (annual O&M)
IV	Perdido Groundwater, AL Waste Spill Area 09/30/88 1st-Final	GW contaminated with benzene	Not specified	GW pump and onsite treatment using air stripping or carbon adsorption with reinjection into the aquifer; and GW monitoring	GW cleanup level will attain the MCL for benzene 5 ug/l	$169,000 (capital) $103,000 (annual O&M)
IV	Powersville Landfill, GA 09/30/87 1st-Final	Soil and GW contaminated with VOCs, organics, pesticides, and metals	Not specified	Capping with grading; installation of monitoring wells and gas vents; provision for alternate water supply (extension of existing municipal water supply); and institutional controls including deed restrictions to restrict drilling or construction activities	Current contaminant concentration levels do not exceed SDWA	$4,000,000 (capital) $577,013 (present worth O&M)
IV	Pioneer Sand, FL 09/26/86 1st-Final	Soil and pond waters contaminated with VOCs, sludges, metals, and inorganics	Not specified	RCRA Subtitle D landfill closure; leachate collection, treatment, and onsite disposal; SW treatment and onsite discharge; and cover system for sludge and pond waste	Not specified	$462,025 (capital) $45,000 (O&M) (year 1) $34,900 (annual O&M) (years 2-30)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Sapp Battery, FL 09/26/86 1st-Final	GW, SW, soils, and sediments contaminated with metals	94,000 yd^3 (soil) 20,000 yd^3 (sediments)	Excavation, solidification/fixation, and onsite disposal of solidified soil and sediments; GW pump and treatment; SW treatment and discharge; and assessment of potential institutional controls	Cleanup criteria for indicator chemicals were set based on Federal and State standards and risk-based levels	$14,318,544 (capital) $25,631 (annual O&M)
IV	SCRDI/Dixiana, SC 09/26/86 1st-Final	GW contaminated with VOCs including PCE, organics including PAHs and PCBs, inorganics, and pesticides	Not specified	GW pump and treatment with discharge to SW	GW will be treated to attain the ACL equivalent to 10^{-6} excess cancer risk	$751,250 (capital) $2,128,100 (annual (O&M)
IV	Sodyeco, NC 09/24/87 1st-Final	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PAHs	150 yd^3 (area D soil)	Excavation and incineration of 150 yd^3 of contaminated soil in area D and backfilling with clean soil; onsite treatment of contaminated soil in area C which may include flushing, soil washing, thermal processing, or in-situ steam stripping; capping of area 3 with asphalt; and GW pump and treatment with discharge to SW	Soil treatment will attain all ARARs following GW remediation. GW cleanup goals are based on MCLs, AWQC, MCLGs, NAAQ, and public health evaluation levels which include TCE 2.7 ug/l, PCE 0.8 ug/l, toluene 2,000.0 ug/l, xylene 440.0 ug/l, total PAHs 2.8 ng/l, chlorobenzene 60.0 ug/l, 1,2-DCE 400.0 ug/l, and ethylbenzene 680.0 ug/l	$2,089,000 - $3,865,000 (present worth)
IV	Tower Chemical, FL 07/09/87 1st	Soil and GW contaminated with pesticides and metals	4,000 yd^3 100,000,000 gals	Excavation and onsite thermal treatment of 4,000 yd^3 of soils and contaminated drum contents; decontamination of debris; residual analysis (if non-hazardous, backfill treated soil and debris onsite); GW pump and onsite treatment using filtration and activated carbon with offsite discharge to SW; installation of two individual treatment units for private wells; and institutional controls to include access restrictions	Soil cleanup goals will attain a 10^{-6} health-based risk level, which includes copper 100.0 mg/kg, lead 100.0 mg/kg, arsenic 5.0 mg/kg, and DDT 35.0 mg/kg. GW treatment will attain Florida Administrative Code levels, drinking water health advisory levels, 10^{-6} health based levels, and alternate concentration levels (based on 10^{-6} risk level), which include arsenic 0.05 ug/l, nickel 350.0 ug/l, chromium 0.05 ug/l, alpha-BHC 0.05 ug/l, chloroform 5.0 ug/l, DDT 0.01 ug/l, chlorobenzilate 1.0 ug/l, and dicoto 1.0 ug/l	$6,788,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IV	Tri-City Oil, FL 09/21/87 1st-Final	None	Not applicable	No further action	Contaminant concentration levels are below analytical detection limits	$0
IV	Varsol Spill Site, FL 03/29/85 1st	None	Not specified	No further action	Not specified	$0
IV	Wamchem, SC Industrial Facility 06/30/88 1st	Soil and GW contaminated with VOCs and organics	2,000 yd^3	Excavation and low temperature thermal aeration of contaminated soils followed by onsite disposal; GW pump and treatment using carbon adsorption; and GW monitoring	GW cleanup goals were based on federal AWQC and include: benzene 0.7 mg/l, toluene 5.0 mg/l, xylenes 2.0 mg/l. Soil cleanup goals were based on estimates of contaminants that would not result in future exceedences of AWQL in GW at the source due to soil contaminant leaching. Some individual goals include: benzene 2.43 mg/kg, toluene 34.47 mg/kg, total xylene 67.58 mg/kg, and naphthalene 74.57 mg/kg	$1,310,600 (capital) $155,100 (annual O&M)
IV	Whitehouse Waste Oil Pits, FL 05/30/85 1st-Final	GW, SW, and soil contaminated with VOCs including benzene, metals including chromium, and organics including phenols and PAHs	Not specified	Slurry wall construction; GW pump and treatment; removal of contaminated sediments; and RCRA capping of the entire site	GW and SW quality should meet State primary drinking water standards. Soil and sediments will be removed to background or "minimal" risk levels	$3,049,000 (capital) $96,630 (annual O&M)
IV	Zellwood, FL Waste Disposal Facility 12/17/87 1st-Final	Soil, sediments, sludge, and GW contaminated with organics, metals, inorganics, and pesticides	147,825 tons	Excavation of soils and sediments with onsite thermal destruction; residual testing to determine final ash disposal; GW pump and treatment with flushing of treated GW through the abandoned drum area; and GW monitoring	Not specified	$41,264,000 - $61,908,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	A&F Materials-Greenup, IL 11/23/83 IRM	GW and soil contaminated with organics including PCBs, metals, and inorganics	Not specified	Removal and offsite disposal of contaminated tank liquids and drum wastes; and temporary capping of lagoons	Not specified	$111,000 (capital) O&M (not privided)
V	A&F Materials Company, IL 06/14/85 2nd	Soil and SW contaminated with organics including PCBs, and metals	Not specified	Removal and offsite disposal of all contaminated soil; cleaning and removal of onsite equipment and buildings; soil testing beneath the building with disposal if above recommended action levels; site grading; and removal of site fencing	Soil > 1 mg/kg PCBs will be removed. Other Action Levels for key contaminants include benzene 1 ug/gm, toluene 12 ug/gm, trichlorethylene 1 ug/gm, chromium 80 ug/gm, and cadmium 5 ug/gm	$824,000 (capital) O&M (not provided)
V	A&F Materials, IL 08/14/86 3rd-Final	GW contaminated with VOCs including TCE, inorganics, and metals	Not specified	GW monitoring with installation of additional monitoring wells; and institutional controls	Not specified	PRP responsibilty
V	Acme Solvents, IL 09/27/85 1st	GW and soil contaminated with organics including PCBs, VOCs including TCE, and inorganics	Not specified	Provision for interim alternate water supply system by installation of home carbon treatment units; and excavation and offsite disposal of non-incinerable wastes and incineration of other waste materials and soils	Not specified	To be determined
V	Allied/Ironton Coke, OH Industrial Facility 09/29/88 2nd-Final	Soil and GW contaminated with VOCs including benzene, and organics including phenols and PAHs, and metals	456,000 yd^3	Installation of a containment system including a slurry wall surrounding the disposal area and multi-media RCRA cap; GW pump and treatment using activated carbon with residual discharge to the Ohio River; provision of an alternate drinking water source; deed restrictions; preparation of a supplemental RI/FS addressing nonaqueous phase substance contamination with implementation of remedy, if different from present containment; and GW monitoring	GW cleanup levels are based on MCLs, AWQCs and 10^{-6} health-based levels and incude benzene 5 ug/l (MCL), phenols 300-3,500 ug/l, and PAHs 0.005 ug/l	$13,130,000 (present worth) $515,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Arcanum Iron & Metal, OH 09/26/86 1st–Final	GW, SW, soil, and sediments contaminated with inorganics including lead, antimony, and arsenic	Onsite soils with >500 mg/kg lead, 20,000 yd^3; battery casing chips, 3,800 yd^3; offsite soils not specified	Excavation and offsite disposal of soil with >500 mg/kg lead; excavation and onsite disposal of soil with lead between background and 500 mg/kg; removal of battery casings; conduction of treatability studies and onsite landfilling; and deed restrictions on land and aquifer usage	Soil cleanup goals based on CDC Acceptable Daily Intake levels including offsite disposal of lead >500 mg/kg and onsite disposal of lead between background and 500 mg/kg. Excavation of offsite soils will be conducted until background levels are reached	$9,929,000 (capital) $37,000 (annual O&M)
V	Arrowhead Refinery, MN 09/30/86 1st–Final	GW, SW, soil, and sediments contaminated with VOCs, organics including PAHs, and metals including lead	4,600 yd^3 (sludge) 20,500 yd^3 (soil and sediments)	Excavation and onsite incineration of contaminated soil, sediments, and sludge; GW pump and treatment; and extension of municipal water supply system to affected residents	Soils and sediments will be excavated and treated to achieve a 10^{-6} excess cancer risk level. GW treatment will also achieve the 10^{-6} level	$22,000,000 (capital) $130,000 – $180,000 (annual O&M)
V	Belvidere Landfill, IL 19.3-Acre Industrial/ Municipal Landfill 06/30/88 1st–Final	GW and soil contaminated with organics including PAHs and PCBs, and metals including lead	790,000 yd^3	RCRA capping over entire landfill; remediation of soil from the drum disposal area following sampling to determine extent of PCB contamination; GW pump and treatment possibly using air stripping with either discharge to the river or city treatment plant; GW, pond, and river fish monitoring; fencing; deed restrictions; and flood control measures	GW will be treated until a 10^{-6} cumulative life-time cancer risk is met at the boundary, which is the point of compliance. PCBs > 50 mg/kg will be disposed of, or incinerated, offsite. PCBs < 50 mg/kg will be consolidated on the landfill. Quantitative goals were not specified for other indicator chemicals	$5,900,000 (capital) $271,000 (annual O&M)
V	Berlin & Farro, MI 02/29/84 1st	SW, soil, and air contaminated with VOCs, and organics including PCBs	Not specified	Excavation of contaminated landfill, drum, and soil areas; separation of PCB and non-PCB wastes with offsite disposal; offsite incineration of liquid wastes and landfilling of solid wastes; and backfilling or capping of site	Not specified	Not specified

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Burlington Northern, MN 06/04/86 1st–Final	GW and soil contaminated with organics	9,500 yd^3	Excavation and onsite aerobic breakdown and transformation of contaminated soils and sludges; and onsite RCRA capping	Possible goals are to achieve detoxification of soils as defined by the microtox test and achieve total PAH and benzene extractable concentrations in the treatment zone equal to or less than concentrations present in the soil left in place	$582,000 (capital) $36,000 (annual O&M)
V	Burrows Sanitation, MI 09/30/86 1st–Final	GW, SW, soil, and sediments contaminated with metals, and inorganics including cyanide	250 yd^3	Excavation, solidification/fixation, and offsite disposal of metal hydroxide sludges; and GW pump and treatment	GW cleanup based on current lowest regulated concentrations for each indicator chemical. Criteria will be taken from the SDWA, Acceptable Chronic Intake Levels, and Health Advisories. Soil cleanup will be based on the site-specific Endangerment Assessment	$1,256,700 – $1,335,400 (depending on distance to offsite RCRA facility) (capital) $115,000 (annual O&M)
V	Byron/Johnson Salvage, IL 03/13/85 1st	Soil contaminated with VOCs, organics including PCBs, and metals including lead and arsenic	Not specified	Excavation and offsite disposal of drums; offsite RCRA disposal of EP toxic soils and, if possible, incineration or treatment of liquids; and in-situ treatment of cyanide contaminated soil	Remedy consists of treatment of soil that exceeds 100 times the drinking water standard, and onsite treatment of soil containing 71 mg/kg amenable cyanide	$1,170,919 (capital) $6,000 (annual O&M)
V	Byron/Johnson Salvage Yard, IL 09/23/86 2nd	GW contaminated with VOCs including TCE, metals, and inorganics including cyanide	Not specified	Provision of home carbon treatment units and bottled water as an interim alternate water supply	Remedy will comply with 10^{-6} cancer risk levels for suspected carcinogens	$115,500 (capital) $165,300 (annual O&M)
V	Cemetery Dump, M 09/11/85 1st	GW and soil contaminated with VOCs, and organics including PCBs	Not specified	Excavation and offsite RCRA disposal of 250 drums	Not specified	$1,883,261 (capital) O&M (not provided)
V	Charlevoix, MI 06/12/84 IRM	GW contaminated with VOCs including TCE and PCE	Not specified	Provision for a permanent alternate water supply	Not specified	$1,954,000 (capital) $118,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Charlevoix, MI 09/30/85 2nd–Final	GW contaminated with VOCs including TCE and PCE	Not specified	Plume discharge to Lake Michigan under natural flow conditions; long-term plume monitoring; and institutional controls on private well installation	Under natural flow conditions, TCE and PCE will meet 0.008 ug/l and 0.01 ug/l, respectively	$0 (capital) $17,000 (annual O&M)
V	Chem-Dyne, OH 07/05/85 1st–Final	GW and soil contaminated with VOCs, organics including PCBs, and metals	Not specified	GW pump and treatment; demolition of onsite buildings; removal of selected soil; and RCRA capping	GW will be treated to <100 ug/l total VOCs to meet background levels, or 10^{-6} cancer risk level	$11,600,000 (capital) $597,000 (annual O&M)
V	Coshocton Landfill, OH 80-Acre Municipal/ Industrial Landfill 06/17/88 1st–Final	Sediments, GW, SW, and leachate contaminated with VOCs including TCE and toluene, organics including PAHs and PCP, and metals including copper, nickel, and zinc	Not specified	Implementation of institutional controls including deed and access restrictions; site grading; State solid waste landfill capping followed by a topsoil cover and revegetation; and GW, SW, and landfill gas monitoring. Components to be evaluated during design include landfill gas collection and venting; and leachate and GW collection, onsite storage, and onsite or offsite treatment	Contaminants which have established MCLs were below MCL levels. SW and sediment chronic concentration values for aquatic life were not exceeded. State sanitary landfill closure requirements will be met to manage the principle threat of future releases from the site	$8,010,000 (capital) $96,000 (annual O&M)
V	Cross Brothers, IL 03/25/85 IRM	Soil contaminated with VOCs	Not specified	Excavation and offsite disposal of surficial and buried waste materials, and visibly contaminated soil	Not specified	$377,728 (capital) $0 (O&M)
V	Eau Claire, WI 06/10/85 IRM	GW contaminated with VOCs including PCE	11,200,000 gal/day	GW treatment using air stripping with discharge to municipal water treatment plant and distribution system	Aeration treatment will remove 99.6% 1,1-dichloroethene from GW	$1,420,000 (capital) $195,000 (annual O&M)
V	Eau Claire, WI Municipal Well Field 03/31/88 2nd–Final	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using the existing air stripper with discharge to the municipal water system; and provision of municipal water to private well users	GW treatment will attain the additive 10^{-6} health-based risk level at the potential receptor, and meet MCLs for TCE 5 ug/l, DCE 7 ug/l, and chloroform 100 mg/l, and State WQC for PCE 1 ug/l	$1,214,200 (capital) $396,700 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Envirochem, IN 09/25/87 1st	Soil, sediments, SW, and GW contaminated with VOCs, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soils and sediments under a RCRA multi-layer cap; re-routing of SW; GW collection and treatment; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5.0 ug/l, 1,1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 (present worth)
V	Fields Brook, OH 09/30/86 1st	Brook sediments contaminated with VOCs including TCE and PCE, organics including PCBs, and metals	36,000 yd^3	Excavation, solidification, and onsite disposal of contaminated sediments	Sediments will be excavated to a 10^{-6} excess cancer risk or to 50 mg/kg PCBs, whichever is greater	$35,100,000 (capital)
			16,000 yd^3	Excavation and thermal treatment of contaminated sediments with onsite disposal of residuals		$72,000 (annual O&M)
V	FMC, MN 09/30/87 1st-Final	GW contaminated with VOCs including TCE	Not specified	GW extraction with discharge of untreated GW to POTW; and institutional controls to include land use restrictions to mitigate against near-term contaminated GW usage	GW treatment will attain a 10^{-6} health-based risk level and meet the MCLs for 1,2-DCA 5.0 ug/l, 1,1,1-TCA 200 ug/l, TCE 5.0 ug/l, PCE 10.0 ug/l, 1, 1-dichloroethylene 7.0 ug/l, and benzene 5.0 ug/l. Minnesota Recommended Drinking Water Limits will be met for 1,1,2-TCA 6.1 ug/l, 1,2-DCE 7.0 ug/l, toluene 2,000.0 ug/l, and xylene 440.0 ug/l	$1,518,005 (present worth)
V	Forest Waste, MI 02/29/84 IRM	Soil contaminated with organics including PCBs	Not specified	Fencing	Not specified	$100,000 (capital) $0 (O&M)
V	Forest Waste, MI 06/30/86 1st	Soils and sediments contaminated with organics and metals	4,000 yd^3 110,000 gals	Excavation of sludges and sediments and removal of aqueous lagoon wastes with solidification and offsite RCRA disposal	Cleanup levels will achieve an ingestion rate of 0.1g/day of soil for a 70 kg adult	$1,295,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Forest Waste Disposal, MI 11-Acre Industrial/Municipal Landfill 03/31/88 2nd-Final	Soil and GW contaminated with organics including PAHs and PBBs, VOCs including TCE and toluene, and metals including arsenic and lead	1,000 yd^3 (soil) 4,000 drums (liquid and solid waste)	Removal and offsite incineration of drums and associated contaminated soil, followed by installation of a containment system around the landfill including a RCRA cap, slurry wall, and a dewatering system with a leachate collection, treatment and disposal system; access and deed restrictions; and GW monitoring	Remedy addresses control of contamination, which will ensure GW lifetime cancer risk range of 10^{-4} to 10^{-7}. Cleanup goals for individual chemicals were not specified	$23,820,000 (present worth) $440,500 (annual O&M)
V	Fort Wayne Reduction, IN 15-Acre Municipal Landfill/Waste Disposal Facility 08/26/88 1st-Final	Soil and GW contaminated with 43 indicator chemicals including VOCs, organics, and metals	4,600 drums (liquid wastes)	Municipal landfill: solid waste closure capping; GW monitoring; and deed and access restrictions. Waste disposal facility: excavation, reconsolidation, and on- or offsite incineration from Area C followed by soil capping; GW collection and treatment, if necessary; flood control measures; and compensation for 0.3 acres of wetlands through enhancement of remaining wetlands	Contaminant levels in the area of the municipal landfill do not pose a threat to human health or the environment. GW monitoring will ensure protection of the river through the use of ACLs as a performance standard. Specific goals will be determined during design. MCLs are not ARAR since GW is not used as a drinking water source. The fate of GW in the waste disposal facility area will be determined during design	$10,020,000 (present worth)
V	IMC/Terre Haute, IN Industrial Facility 06/22/88 1st-Final	Soil contaminated with BHC-tech and the pesticide lindane	28,500 yd^3	No further action (because previous soil cleanup has proven effective in containing the source of contamination) with implementation of a maintenance program; GW monitoring; access restrictions; and establishment of a contingency plan	Remedy addresses control of contaminant migration, thus individual goals are not applicable	$159,000 (present worth O&M)
V	Industrial Excess Landfill, OH 09/30/87 1st	GW contaminated wth VOCs, organics, and inorganics	Not specified	Provisions of an alternate water supply to approximately 100 homes	Chemical-specific cleanup goals will be selected in 2nd O.U.	$1,715,870 - $2,289,060 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Johns-Manville, IL 06/30/87 1st-Final	Soil, SW, GW, and air contaminated with inorganics including asbestos	Not specified	Grading and covering waste materials and soil in inactive water disposal areas; closure of asbestos pit cover; offsite disposal of asbestos-containing material generated from reconstruction activities following final closure of disposal pit in FY89; and SW, GW, and air monitoring system	All media will attain NESHAP requirements for asbestos	$4,026,000 (capital) $49,000 (annual O&M)
V	Kummer Landfill, MN 06/12/85 1st	GW contaminated with VOCs	Not specified	Provision for an alternate water supply	Remedy will reduce cancer threat to <10^{-6} risk level	$1,624,850 (capital) $28,440 (annual O&M)
V	Kummer Sanitary Landfill, MN 35-Acre Landfill 09/30/88 2nd	Soil and GW contaminated with VOCs including TCE, PCE, and benzene	1,300,000 yd^3 (soil and waste material)	Consolidation of soil and other waste material with site grading and construction of a cap consisting of a gas control layer, a low permeability layer (clay or synthetic membrane), and a drainage layer, with soil cover and vegetation; access and deed restrictions; and GW and landfill gas monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	Clay cap $7,400,000 - $12,500,000 (capital) $35,000 (annual O&M) or synthetic membrane $6,900,000 - $11,200,000 (capital) $33,000 (annual O&M)
V	Lake Sandy Jo, IN 09/26/86 1st-Final	SW, soils, and sediments contaminated with VOCs, organics including PAHs, and metals	2,500 yd^3	Soil capping; alternate water supply; onsite consolidation of sediments; and institutional controls including deed restrictions on aquifer usage	Sediments with contaminants above the 10^{-6} risk level will be excavated and consolidated	$4,747,000 (capital) $63,000 (annual O&M)
V	LaSalle Electrical, IL 08/29/84 1st	Offsite soils contaminated with VOCs, and organics including PCBs	25,530 yd^3	Excavation and onsite incineration of offsite soils	Excavation and incineration of soils with greater than 5 mg/kg PCBs in the first 12 inches of soil, and greater than 10 mg/kg in soils at depths below 12 inches	$26,400,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	LaSalle Electrical Utilities, IL Industrial Facility 03/30/88 2nd-Final	Soil, sediments, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation and onsite incineration of contaminated soil and sediments; flushing and mechanical cleaning of sewer lines; demolition and disposal of buildings; and GW collection and treatment	GW will be treated to achieve MCLs for VOCs. PCBs >1 mg/l will be treated. Soil will be excavated to 5 mg/kg in surface soils and 10 mg/kg at depths > one foot	$34,495,180 (present worth) $64,000 (annual O&M)
V	Laskin Poplar Oil, OH 08/09/84 1st	SW and soil contaminated with VOCs, and organics including PCBs and PAHs	Not specified	Incineration of contaminated waste oil; and treatment of contaminated waste water	Not specified	$1,043,000 (capital $0 (O&M)
V	Laskin Poplar Oil, OH 09/30/87 2nd	Soils, oil waste water, and sludge contaminated with VOCs, organics including PCBs and PAHs, and inorganics	900,000 yd^3 771,000 gals	Onsite incineration of oils, sludges, and soils with offsite disposal of all incinerator ash; offsite treatment of waste water; decontamination of water and scrubber water; dismantling and offsite disposal of all tanks; crushing and incineration of pit cinder block walls; and backfilling and/or grading of all excavated areas	Selection of cleanup levels are scheduled in FY88	$8,490,865 (capital) $0 (O&M)
V	LeHillier/Mankato, MN 09/27/85 1st-Final	GW and soil contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping; extension of LeHillier water supply system to affected areas; and abandonment of contaminated wells	The goal of plume extraction and treatment is consistent with the 10^{-6} cancer risk concentration for TCE 2.8 ug/l	$800,000 (capital) $70,000 (annual O&M)
V	Liquid Disposal, MI 09/30/87 1st-Final	Soil and GW contaminated with VOCs, organics including PCBs, and inorganics	Not specified	Onsite land disposal of all debris and equipment; onsite solidification/fixation of soil and waste; construction of a slurry wall and impermeable cap containment system; and GW pump and treatment using air stripping and ion exchange with discharge to SW	Target cleanup levels (TCLs) for soil and GW will be based on 10^{-6} health-based risk level. For noncarcinogens in GW, MCLs and health-based levels were used as TCLs which include barium 1000.0 ug/l, cadmium 10.0 ug/l, chloroform 0.1 ug/l, benzene 0.2 ug/l, methylene chloride, 1.0 ug/l, and TCE 0.8 ug/l. TCL soil cleanup goals include TCE 77.0 ug/g, PCE 16.0 ug/g, benzo(a)pyrene 0.4 ug/g, PCBs 1.0 ug/g, and lead 20.0 ug/g	$21,743,100 (capital) $316,600 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Long Prairie, MN Municipal Well Field 06/27/88 1st-Final	Soil and GW contaminated with VOCs including PCE and TCE	7,000,000 gals	GW pump and treatment using air stripping with discharge to the river; and onsite soil treatment using active venting	Protection will be provided corresponding to the 10^{-5} carcinogenic risk level. Individual goals include TCE 5 ug/l (MCL), vinyl chloride 0.15 ug/l (State), and DCE 70 ug/l (State). Currently, there are no MCLs for PCE or DCE. AWQC will be met by the discharge limit for PCE 5 ug/l. Following treatment, PCE in soil will correspond to the 10^{-6} carcinogenic risk level of 1,400 ug/kg	$2,000,000 (present worth) $390,000 (annual O&M year 1) $250,000 (annual O&M years 2-5)
V	Main Street, IN 08/02/85 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW treatment using air stripping with discharge to water treatment system and drinking water distribution system	The air stripping system is designed to achieve a 99.1% removal of TCE, 88.9% removal of PCE, and 96.7% removal of 1,1-DCE	$1,106,000 (capital) $158,000 (annual O&M)
V	Marion-Bragg Landfill, IN 09/30/87 1st-Final	Soil, SW, and GW contaminated with VOCs, organics including PAHs, and inorganics	1,100,000 yd^3	Regrading and capping of site; provision for maintaining flood control measures; construction and maintenance of perimeter fence; provision of three private use drinking water wells; and additional GW studies, as necessary	Selection of appropriate GW cleanup levels deferred until selection of GW treatment O.U.	$5,800,000 (capital) $1,000,000 (present worth O&M)
V	Mason County Landfill, MI 10-Acre Landfill 09/28/88 1st	GW contaminated with VOCs including benzene, PCE, TCE, and xylenes	Not specified	Construction of a RCRA cap over the landfill; deed and access restrictions; and GW monitoring	Remedy addresses control of contaminant migration; establishment of cleanup goals for GW contamination is deferred until a remedy is selected for the GW operable unit	$2,800,000 (present worth) $1,000,000 (present worth O&M)
V	Metamora Landfill, MI 09/30/86 1st	GW and soil contaminated with VOCs including TCE and PCE, and metals	18,150 yd^3	Excavation and offsite thermal destruction of wastes from areas 1 and 4	GW and soil cleanup targets will be established in the FY88 RI/FS	$41,500,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Mid-State Disposal Landfill, WI 33-Acre Industrial/ Municipal Landfill 09/30/88 1st-Final	Soil, GW, and SW contaminated with VOCs including benzene, PCE and TCE, and metals	Not specified	Installation of new soil/clay caps for lagoon and landfill and in situ solidification/stabilization of sludge and landfill gas flaring, if necessary; site monitoring that includes GW, SW, and landfill gas monitoring; offsite GW monitoring; provision of an alternate water supply for nearby residences; improvement of SW drainage; leachate and ponded water collection and offsite treatment; access restrictions; institutional controls;	GW will gradually meet state standards and 10^{-6} cancer risk levels for ingestion as a result of natural attenuation and a decrease in leachate contamination. Individual contaminant goals were not specified	$16,000,000 (present worth) $220,000 (O&M) (year 1) $100,000 (O&M) (years 2–30)
V	Morris Arsenic, MN 08/07/85 1st-Final	None	None	No further action	Not specified	$0
V	New Brighton, MN (Interim Water Treatment) 06/24/83 IRM	GW contaminated with VOCs including TCE	Not specified	Interim GW treatment using granular activated carbon and air stripping	Not specified	$150,400 (capital) $30,526 (annual O&M)
V	New Brighton, MN (Water Supply System) 09/19/83 IRM	GW contaminated with VOCs including TCE	Not specified	Extension of existing public water supply system to affected residents	Not specified	$217,958 (capital) O&M (not specified)
V	New Brighton, MN (Water Supply System) 08/02/84 IRM	GW contaminated with VOCs	Not specified	Extension of existing public water supply system to replace contaminated municipal system	Not specified	$142,090 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	New Brighton/ Arden Hills/St. Anthony, MN 06/30/86 4th	GW contaminated with VOCs including TCE and PCE, and organics	Not specified	Provision of alternate water supply through well construction	Not specified	$600,500 (capital) $22,820 (annual O&M)
V	New Brighton/ Arden Hills/St. Anthony, MN 03/31/87 5th	GW contaminated with VOCs including TCE and PCE	Not specified	Construction of granular activated carbon (GAC) water treatment facilities with discharge to the municipal water treatment plant; and construction of a pipeline from wells to the treatment facilities	GW treatment will attain the MCL for TCE of 5.0 ug/l. MCLs for other VOCs have not been exceeded	$1,100,500 (capital) $160,770 (annual O&M)
V	New Brighton/ (TCAAP), MN 09/25/87 3rd	GW contaminated with VOCs and metals	Not specified	GW pump and treatment with air stripping and onsite reinjection to aquifer	GW cleanup goals will attain 10^{-6} health based levels. Discharged water will, at a minimum, meet MCL values which include benzene 5.0 ug/l, toluene 2,000.0 ug/l, TCE 5.0 ug/l, PCE 6.9 ug/l, vinly chloride 2.0 ug/l, xylene 440.0 ug/l, arsenic 50.0 ug/l, and chromium 50.0 ug/l	$4,000,000 (capital) $120,000 (annual O&M)
V	New Lyme Landfill, OH 09/27/85 1st-Final	GW, soil, and sediments contaminated with VOCs, organics, and inorganics including asbestos	Not specified	Capping; installation and operation of extraction/containment wells to dewater landfill and eliminate leachate; onsite GW and leachate treatment using biological disc, sodium hydroxide precipitation, and granular activated carbon; onsite consolidation of contaminated sediment; and fencing	Not specified	$10,798,000 (capital) $44,000 (annual O&M)
V	Ninth Avenue Dump, IN Waste Disposal Area 09/30/88 1st	GW contaminated with VOCs including benzene, toluene, xylenes, organics including PCBs, metals, and cyanides	250,000 - 700,000 gal (oil)	Extraction of oil and GW with diversion of GW to a recharge system and oil to an onsite storage tank; construction of a soil-bentonite slurry wall which will require filling 0.5-1.0 acre of wetlands; and GW monitoring	Remediation invokes the interim remedy waiver for contaminant-specific ARARs; however, GW treatment and discharge will meet MCLs. Individual MCL goals were not provided	$1,960,000 (capital) $190,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	NL/Taracorp/ Golden Auto Parts, MN Industrial Facility/Lead Smelter 09/29/88 2nd–Final	None	None	No action remedy	No action attains the State ARAR of 1,000 mg/kg for soil lead, as well as the ATSDR guidance level of 500 – 1,000 mg/kg	$0
V	Northern Engraving, WI 09/29/87 1st–Final	Soil, sludge, and GW contaminated with VOCs including TCE, and inorganics	4,400 yd^3	Excavation and onsite solidification of sludge and soil; installation of RCRA cap atop lagoon; and institutional controls to include deed and access restrictions to seepage pit	GW cleanup will be managed through the use of ACLs that are protective of the river. ACLs include TCE 21,900.0 ug/l, copper 12.0 ug/l, nickel 160.0 ug/l, and zinc 110.0 ug/l	$295,000 (capital) $16,000 (annual O&M)
V	Northernaire, MI 09/11/85 1st	GW, soil, and sewer sediments contaminated with metals including chromium and cadmium	Not specified	Excavation and offsite disposal of soil and sewer line to privately-owned RCRA facility; cleaning dust and hazardous residue from building floor; breaking up of 300 ft^2 of floor and drywell, sampling soil, excavation, and disposal of any contaminated debris and soil at a RCRA Subtitle C facility; and backfilling of area with clean soil	Excavation of soils and sediments will meet response objectives of chromium 50 mg/kg and cadmium 10 mg/kg	$75,000 (capital) $0 (O&M)
V	Northside Landfill, IN 09/25/87 1st	Soil, sediments, SW, and GW contaminated with VOCs including TCE, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soils and sediments under a RCRA multi-layer cap; re-routing of SW; GW and leachate collection and treatment system; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5.0 ug/l, 1-1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 (present worth)
V	Novaco Industries, MI 06/27/86 1st	GW contaminated with metals including chromium	36,000,000 gals	GW pump and treatment using electrochemical reduction, precipitation, filtration, and ion exchange with discharge to creek; and GW extraction from the sand/gravel aquifer	Treatment will remove hexavalent chromium from the GW to concentrations below 50 ug/l and trivalent chromium concentrations to below 100 ug/l	$560,000 (capital) $419,000 (annual O&M) (years 1–6)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Oak Grove Landfill, MN 45 to 50-Acre Municipal Landfill 09/30/88 1st	Soil, GW and SW contaminated with VOCs including toluene and xylenes	Not specified	Deed and access restrictions; capping with low permeability layer, and top soil cover and vegetation; and air and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$6,400,000 to 11,100,000 (clay cap) (present worth) or $5,500,000 to $9,300,000 (synthetic membrane) (present worth) $42,000 (clay cap) (annual O&M) or $40,000 (synthetic membrane) (annual O&M)
V	Old Mill, OH 08/07/85 1st-Final	GW and soil contaminated with VOCs and organics including PCBs	Not specified	Removal and offsite disposal of 95 percent of soil contaminants; GW extraction and treatment using granular activated carbon; aquifer use restrictions; and provision of public water supply to residences potentially affected	Soils contaminated with base/neutral compounds will be removed to background, and VOC removal will be to the 10^{-6} cancer risk level. GW cleanup has been proposed to meet the 10^{-5} risk level	$3,917,000 (capital) $45,000 (annual O&M)
V	Outboard Marine Corp., IL 05/15/84 1st	GW, soil, and river sediments contaminated with VOCs, and organics including PCBs	Not specified	Excavation and offsite disposal of PCB contaminated materials; construction of onsite containment cell for moderately contaminated PCB material; capping; GW diversion; construction of clay-lined dewatering lagoon; and treatment of supernatant with discharge to harbor	Not specified	$21,570,000 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Petersen Sand & Gravel, IL Mining and Waste Disposal Area 09/14/88 1st–Final	None	Not applicable	No further action with SW and sediment monitoring	Not applicable	$0
V	Poer Farm, IN Industrial Facility 09/29/88 1st–Final	None	Not applicable	No further action after abandoning GW monitoring wells	Not applicable	$0
V	Pristine, OH Waste Disposal Facility 12/31/87 1st–Final	Soil, sediments, GW, SW, and buildings contaminated with VOCs including PCE and TCE, metals, and pesticides (dioxin in soils and sediments only)	37,700 yd^3	Excavation, onsite consolidation; of 1,725 yd^3 of sediments and soil; and in situ vitrification of soil; installation of a french drain; GW pump and treatment using air stripping with offsite discharge to Mill Creek; decontamination of structures followed by removal and disposal at a solid waste landfill; implementation of institutional controls including deed and access restrictions; and GW monitoring	The overall health-based cleanup standard of 10^{-6} cumulative excess cancer risk at the plume boundary will be met for all media. Additionally, this remedy will meet the MCL for lead 50 ug/l	$20,837,000 (capital) $94,800 (annual O&M)
V	Reilly Tar, MN 06/06/84 1st	GW contaminated with VOCs and organics including PAHs	Not specified	GW treatment using granular activated carbon	Not specified	$750,000 (capital) $188,000 (annual O&M)
V	Reilly Tar & Chemical, MN 05/30/86 2nd	GW and soils contaminated with VOCs, and organics including PAHs	800,000 - 1,000,000 yd^3	GW pump and treatment; capping and filling of exposed wastes; and discharge of hazardous waste to sewer	Drinking water criteria for PAHs were developed through State and EPA consultations	Cost estimates not fully developed

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Republic Steel Quarry, OH Industrial Facility 09/30/88 1st–Final	Soil contaminated with VOCs and metals	100 yd^3 (soil)	Excavation and offsite disposal of contaminated soil; and GW monitoring	Soil treatment before offsite disposal to meet LDR requirements is not expected to be necessary. Individual removal goals were not specified	$63,200 (present worth)
V	Rose Township, MI 09/30/87 1st–Final	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, and inorganics	50,000 yd^3	Excavation of soil and onsite thermal destruction with disposal of ash as either backfill or placement in an offsite RCRA facility (if ash is EP toxic, leachable lead removal treatment will be required); GW pump and treatment using chemical coagulation, air stripping, and activated carbon adsorption with discharge in appropriate manner; and fencing	Cumulative soil cleanup will attain 10^{-6} cancer risk level which includes arsenic 14.0 mg/kg, PCBs 10.0 mg/kg, and lead 70.0 mg/kg. GW levels will also attain the 10^{-6} cancer risk level which includes vinyl chloride 0.015 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, chlorobenzene 60.0 ug/l (proposed MCLG), benzene 0.133 ug/l, TCE 0.627 ug/l, PCBs 0.002 ug/l, and methylene chloride 0.919 ug/l	$32,547,000 (capital) $200,000 (annual O&M) (years 1–10) $70,000 (annual O&M) (years 10–30)
V	Schmalz Dump, WI 08/13/85 1st	Soil contaminated with VOCs, organics including PCBs, and metals including chromium	3,500 yd^3	Excavation and offsite disposal of contaminated building debris and sediments with dewatering	PCBs will be removed in the dewatering process to below 0.5 ug/kg	$2,088,300 (capital) $0 (O&M)
V	Schmalz Dump, WI 09/30/87 2nd–Final	Soil contaminated with metals	Not specified	Installation of a low permeability, compacted earth material cap over approximately seven acres of soil	Trivalent chromium does not exceed the MCL (50.0 ug/l) and lead was not reported above detection units	$687,664 (capital) $17,940 (annual O&M)
V	Seymour, IN 09/30/86 1st	GW and soil contaminated with VOCs, organics, and metals	101,690,000 gals	GW extraction and treatment with discharge to POTW	Water discharge will conform with POTW standards	$300,000 (capital) $100,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Seymour Recycling, IN 09/25/87 2nd–Final	Soil, sediments, and GW contaminated with VOCs including TCE, and organics	3,000 yd^3	Implementation of a full scale soil vapor extraction system; installation of a multimedia cap; excavation of contaminated sediments and consolidation of sediments beneath cap; GW pump and treatment; and institutional controls to include deed and access restrictions with compliance point at the edge of the cap	GW cleanup levels will attain a cumulative 10^{-5} to 10^{-6} cancer risk level. MCLs attributing to this level include benzene 5.0 ug/l, chloroform 100.0 ug/l, 1,2-DCE 7.0 ug/l, TCE 5.0 ug/l, and vinyl chloride 2.0 ug/l. GW cleanup levels for inorganics will meet chronic health values including lead, cadmium, and barium 50.0 ug/l each	$10,536,000 (capital) $7,200,000 (present worth O&M)
V	South Andover, MN Waste Disposal Facility 03/30/88 1st	GW contaminated with VOCs including PCE, TCE, and toluene, and metals including arsenic, cadmium, and chromium	Not specified	GW extraction; provision of an alternate water supply to private well users; GW monitoring; and implementation of well use restrictions	Remediation is aimed at controlling migration, not restoring the aquifer to drinking water standards, thus no cleanup levels were established	$760,000 (present worth)
V	Spiegelberg Landfill, MI 09/30/86 1st	GW and soils contaminated with VOCs, organics, and metals	5,000 yd^3 10,000 yd^3	Excavation of waste materials with offsite incineration of liquid paint sludges and offsite disposal of solid paint sludges	Excavation of all materials exceeding a 10^{-6} excess cancer risk	$15,771,000 - $18,395,000 (capital) $0 (O&M)
V	Summit National, OH Waste Disposal Facility 06/30/88 1st–Final	Soils, sediments, GW and SW contaminated with VOCs including benzene, toluene, xylenes and TCE, organics including phenols, PAHs and PCBs, and metals including arsenic and chromium	30,500 yd^3 (soil) 1,500 yd^3 (sediment) 80,000 gals (drum contents) 1,000–7,500 gals (tank contents)	Excavation and onsite incineration of soil, sediments, and contents of buried drums and tanks, with disposal of incinerator residues in an onsite RCRA landfill; GW pump and treatment and onsite SW treatment using precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption with discharge of treated water to downgradient SW; installation of multilayered cap with grading and revegetation, and construction of a slurry wall around site perimeter; dismantling and onsite disposal of onsite structures; access and deed restrictions; GW and SW monitoring; and residence relocation	Soil cleanup goals will attain a $2x10^{-5}$ cancer risk level. Discharge levels for treated GW and SW will meet Federal and/or State water quality standards. Individual goals for soil and GW contaminants were not specified	$25,000,000 (present worth) $1,132,250 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	United Scrap Lead, OH Industrial Facility 09/30/88 1st-Final	Soil and sediments contaminated with arsenic and lead	46,600 yd^3 (soil) 400 yd^3 (sediment) 55,000 yd^3 (battery casings)	Excavation and treatment of battery casings and contaminated soil by washing, with lead recovery and offsite disposal or recycling of casings, and replacement of residual soils onsite; excavation and dewatering of sediments onsite and disposal with soil; construction of a soil cover, and revegetation; decontamination of contaminated buildings and debris with offsite disposal; installation of a new residential well; deed restrictions; drainage control; and GW and SW monitoring	The target level for cleanup of battery casings and surficial soil is lead 500 mg/kg based on guidelines from the Center for Disease Control. Soils deeper than one foot will be cleaned to the EP toxicity value for lead, 5 mg/l. Sediments will be cleaned to background lead levels (68 mg/kg)	$26,924,000 (present worth) $55,375 (annual O&M)
V	U.S. Aviex, MI Industrial Facility 09/07/88 1st-Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes	11,500 yd^3 (soil)	Onsite soil will be treated using soil flushing; GW pump and treatment (including on- and offsite GW and fluids from the soil flushing) using air stripping with discharge to SW	GW cleanup goals will meet MCLs, proposed MCLGs, or Federal or State water quality criteria. Individual goals include benzene 5 ug/l (MCL), toluene 2,000 mg/l (PMCLG), xylene 440 ug/l (PMCLG), PCE 0.88 ug/l (WQC), and TCE 5 ug/l (MCL)	$3,024,100 (present worth)
V	Velsicol Chemical Corporation, IL Waste Disposal Facility 09/30/88 1st-Final	Soil, sediments, GW, and SW contaminated witn VOCs including benzene, organics including PAHs, and pesticides	87,900 yd^3 (soil) 10,200 yd^3 (sediments)	Excavation of soil and sediments, backfilling with clay, and revegetation; construction of a diversion channel; consolidation of all wastes onsite with clean backfill of excavated areas and in situ stabilization, followed by construction of a RCRA cap; construction of a GW collection drain with disposal via deep well injection or treatment using granular activated carbon before offsite discharge; GW and surface monitoring; and deed restrictions	GW cleanup will attain ACLs including benzene 2,000 ug/l; CPAHs 0.031 ug/l; noncarcinogenic PAHs 5.4 ug/l; and phenols 100 ug/l. Soil and sediments will achieve ACLs including benzene 2 mg/kg; CPAHs 0.010 mg/kg; noncarcinogenic PAHs 0.046 mg/kg and phenols 100 mg/kg	$9,081,000 (present worth)
V	Verona Well Field, MI 05/01/84 IRM	GW and air contaminated with VOCs including TCE and PCE	Not specified	Provision for new wells; implementation of barrier system; treatment of purge water using air stripping system; and treatment of air emissions using activated carbon adsorption	Not specified	$1,796,000 (capital) $470,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
V	Verona Well Field, MI 08/12/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Soil treatment using enhanced volatilization; and GW pump and treatment using existing air stripper	It is estimated that within three years, GW contamination will decrease to 100 ug/l VOCs	$1,660,000 (capital) $90,000 (annual O&M) (years 1–2) $46,000 (annual O&M) (years 3–30)
V	Wauconda Sand & Gravel, IL 09/30/85 1st	GW, SW, and soil contaminated with VOCs, organics including PCBs, and metals	Not specified	Installation of leachate collection drains; provision for leachate disposal at sewage treatment plant or at an offsite hazardous waste treatment facility; regrading with clean soil cover and revegetation of bare and eroded areas; and fencing	Not specified	$1,600,000 (capital) $50,000 (annual O&M)
V	Waste Disposal Engineering, MN Waste Disposal Area 12/31/87 1st–Final	GW contaminated with VOCs and organics; landfill covered with lime-sludge cap	Equivalent of 60,000 – 100,000 barrels of hazardous waste within 2,500,000 yd^3 of solid waste	Installation of a RCRA cap; GW pump and treatment using carbon adsorption with offsite discharge to Coon Creek; installation of a clay slurry wall; implementation of institutional controls including well use restrictions; and site monitoring	The existing concentrations of contaminants in Coon Creek will be brought to below the 10^{-6} health-based risk level and other fresh water criteria established under CWA. The point of compliance will be set at the landfill boundary. SWDA standards are not ARAR since institutional controls will prevent any potential use of the contaminated GW. Also, MCLs have not been established for site contaminants	$9,504,796 (capital) $1,862,915 (present worth O&M)
VI	AT&SF (Clovis), NM Waste Disposal Area 09/23/88 1st–Final	Soil, sediments, GW, and SW contaminated with organics including phenols, inorganics, and metals including arsenic, chromium, and lead	Not specified	Installation of SW run-on controls; evaporation of lake water using a pump and spray sprinkler system; excavation and onsite biodegradation of evaporate and lake sediments in an onsite treatment area; in situ biodegradation of contaminated soil underneath the lake sediments, followed by excavation and placement of the treated soil into the sediment treatment area; capping the treatment area with PVC liner and vegetated soil layer; grading and revegetating the disturbed area; access restrictions; and GW and treatment area monitoring	Remedy is aimed at preventing contamination of the aquifer and will meet all primary State and Federal standards for drinking water. Individual cleanup levels were not specified	$2,840,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Bailey Waste Disposal, TX Waste Disposal Facility 06/28/88 1st-Final	Soil and sediments contaminated with VOCs including benzene, organics including PAHs, and metals	66,980 yd^3	Relocation, consolidation, and treatment of contaminated sediments and wastes using a solidification technique developed during design followed by onsite disposal and capping of the residual matrix	Remediation will attain the excess cancer risk level of $9x10^{-6}$ for adults and $1.2x10^{-5}$ for children. No ARARs exist at this site for contaminated soils and sediments, so no chemical-specific ARARs are available	$13,700,000 (present worth)
VI	Bayou Bonfouca, LA 08/15/85 1st	GW, soil, and sediments contaminated with creosote	Not specified	Offsite disposal of creosote waste	Not specified	$983,000 (capital) $173,743 (annual O&M)
VI	Bayou Bonfouca, LA 03/31/87 2nd-Final	Soil, sediments, and potentially GW, contaminated with organics including PAHs	71,500 yd^3	Excavation and onsite incineration of 51,500 yd^3 of soil, sediment, and sludge with onsite disposal of ash and capping (20,000 yd^3, 34 acres); and GW pump and treatment using technologies to be evaluated during design with reinjection	Soil/sediment contamination > 1,300 mg/kg PAHs will be treated. Soil/sediment contamination >100 mg/kg PAHs will be capped. GW treatment will target the 10^{-4} to 10^{-7} cancer risk level (CWA suggests 3.1 ng/l level for PAHs). Point of compliance is facility property line	$59,594,534 (capital) $173,748 (annual O&M)
VI	Bayou Sorrel, LA 11/14/86 1st-Final	Soil and GW contaminated with pesticides, VOCs, organics, and inorganics	36,400 yd^3	Regrading with top soil; RCRA geomembrane/clay capping of former disposal areas; installation of sand/geofabric pore water drainage layer; installation of a venting system to reduce buildup of gases beneath cap; installation of slurry wall; consolidation of all miscellaneous wastes for grading, fill or offsite disposal; fencing of all capped areas; and construction of gravel access roads around fenced areas	Chemical-specific cleanup levels not provided	$23,200,000 (capital) $5,700,000 (present worth O&M)
VI	Bio-Ecology Systems, TX 06/06/84 1st-Final	Soil and SW contaminated with VOCs including TCE, organics including PCBs, and metals	Not specified	Construction of onsite disposal cell with synthetic liner, leachate collection system, and final cover; stabilization of waste and onsite placement in cell; elevation of site above 100-year flood plain; and fencing	Not specified	$3,709,600 (capital) $20,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Brio Refining, TX Industrial Facility 03/31/88 1st–Final	Soil, sludge, GW, and debris contaminated with VOCs and organics	510,000 – 730,000 yd^3 (soil) 170,225 gals (tank liquids, and NAPLs) 1,757 drums (liquid and solid wastes)	Excavation of soil, pit contents, and surface seeps followed by either incineration (EPA preferred alternative) or aqueous phase biological treatment (PRP preferred alternative) with backfilling of treatment residuals; removal of offsite soil contamination found during RI or RA; consolidation of onsite inert debris and rubble with disposal to be determined during design; removal, decontamination, and dismantling of tanks for future sale or offsite disposal; regrading, placement of topsoil, and revegetation; GW treatment of channel and natural attenuation of aquifer; implementation of institutional controls including deed and access restrictions; and GW, SW, and air monitoring	Media above Endangerment Assessment action levels will be treated to target levels based on a 10^{-6} incremental cancer risk for carcinogens and on an acceptable chronic daily intake for non-carcinogens. Individual action and target levels were not specified. Offsite soil contamination above unspecified background levels will be removed. GW in the channel will be treated to a level determined during design. Since the GW may never be used as a GW source, immediate application of MCLs is not appropriate	$23,300,000 – $23,333,000 (biological treatment) (present worth) $22,450,000 – $26,590,000 (incineration) (present worth)
VI	Cecil Lindsey, AR 04/23/86 1st–Final	None	Not specified	No further action with site access restrictions and GW monitoring	Not specified	$61,000 (capital) $10,000 (annual O&M)
VI	Cleve Reber, LA 03/31/87 1st	Soil, SW, GW, and debris contaminated with organics	6,400 drums 220,000 yd^3 500,000 gals	Excavation and onsite incineration of buried drums and sludges; RCRA capping on land used for disposal of industrial hazardous waste; installation of gas venting pipes; drainage and backfilling of onsite ponds; pond water pump and treatment with discharge to SW; and fencing	Remediation will attain the 10^{-6} cancer risk level through CWA water quality criteria. Specific cleanup goals include hexachlorobutadiene 0.45 ug/l, hexachlorobenzene 21.0 ng/l, and hexachloroethane 2.4 ug/l. Specific excavation and treatment levels not provided	$25,000,000 (capital) $100,000 (annual O&M)
VI	Compass Industries Landfill, OK 09/29/87 1st–Final	Soil and GW contaminated with organics and inorganics	620,000 yd^3	RCRA capping with site grading; SW diversion; fencing with warning signs along cap perimeter; and GW extraction and onsite treatment in upper perched water-bearing zone	GW solid effluent levels will meet NPDES requirements. Other chemical specific levels not provided	$9,255,526 (capital) $272,830 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Crystal City Airport, TX 09/29/87 1st–Final	Soil and debris contaminated with pesticides and inorganics	12,000 yd^3	Onsite consolidation of all materials which exceed 100 mg/kg total pesticides; RCRA capping over consolidation cell; and disposal of decontamination liquids	Soil cleanup will attain 10^{-6} health based cancer risk level for total pesticides >100.0 mg/kg. Debris cleanup will be based on visible inspection	$1,600,000 (present worth)
VI	Dixie Oil, TX Industrial Facility 03/31/88 1st–Final	Soil, GW, and debris contaminated with VOCs, organics, and metals including copper	107,351 yd^3	Site controls including access and deed restrictions; excavation and removal of contaminated offsite soil; consolidation and disposal of onsite debris and rubble; remediation of Mud Gully; operation of the wastewater treatment system followed by dismantling and removal; dismantling, removal, and disposal of tank contents and drums and either selling or offsite disposal of tanks; dismantling and disposal of all process equipment; ambient air sampling and air emissions controls; sampling and monitoring of Mud Gully sediments and GW; and site regrading and revegetation	Endangerment Assessment (EA) did not identify contaminated soil above unspecified EA action levels; therefore, soil treatment is not necessary as long as site controls are enforced. Offsite soil contamination above unspecified background levels will be removed. Mud Gully flood control ditch and the bottleneck will be remediated based on a performance standard to be set during design in cooperation with the Harris County Flood Control District	$241,000 (present worth)
VI	French Limited, TX Industrial Facility 03/24/88 1st–Final	Soil, sludge, and GW contaminated with organics including PCBs and PCP, VOCs, and inorganics including arsenic and metals	70,100 yd^3 (sludge/ sediments) 79,500 yd^3 (soil)	In situ biological treatment; GW pump and treatment; SW treatment; stabilization to prevent leachate generation; backfilling of lagoons with clean soil; and site monitoring	GW will be treated until the point where the 10^{-6} human health criteria can be achieved through natural attenuation in 10 years or less. Additionally, remediation will be consistent with WQC for GW and SW, and TSCA regulations and policy for cleanup of PCBs and PCB-contaminated material. Individual cleanup goals were not specified	$47,000,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Geneva Industries, TX 09/18/86 1st-Final	GW and soils contaminated with VOCs including TCE, and organics including PAHs and PCBs	22,500 yd^3	Excavation and offsite disposal of contaminated soil and drums; capping; and GW pump and treatment using carbon adsorption with discharge to adjacent flood control channel	Soil will be excavated to PCBs 100 mg/kg. GW will be treated to below TCE 1 ug/l	$14,990,000 (capital) $532,000 (annual O&M) (years 1-2) $483,000 (annual O&M) (years 3-30)
VI	Gurley Pit, AR 10/06/86 1st	Soil and sediments contaminated wth organics including PCBs; pit sludge/sediments contaminated with oily waste and metals	432,470 ft^3 (soil, sludge, sediments) 4,100,000 gals	Excavation and stabilization of sludge, soil, and sediment with placement in onsite RCRA landfill; removal of oil from water by oil/water separation with incineration of oil; treatment of pond water with discharge to bayou; and removal of pond water solids to be disposed with pit sludge	Remedy meets RCRA, CAA, NAAQ, and TSCA criteria for PCBs. Specific levels were not provided. Treated pond water discharges comply with NPDES permit requirements	$5,780,000 (capital) $21,000 (annual O&M)
VI	Gurley Pit, AR Waste Disposal Facility 09/26/88 2nd-Final	GW contaminated with metals	Not applicable	No action remedy (long-term GW monitoring as part of a previous source control design)	Concentrations of metals including arsenic, iron, and manganese that exceeded MCLs were not attributable to site contaminants, thus GW cleanup goals are not applicable for this site	$0
VI	Hardage/Criner, OK 11/14/86 1st	Soil, GW and debris contaminated with VOCs including TCE and PCE, organics including PCBs, and inorganics	180,000 yd^3 10,000 - 20,000 (drums)	RCRA capping; installation of leachate collection system; excavation of sludge, drum mounds, and main pit; temporary capping of former source areas (interim measures); onsite or offsite physiochemical treatment of inorganic liquids with discharge to POTW; and treatment of solids by technology to be identified during design. GW remediation to be addressed in future O.U.	Soil and GW cleanup levels will be addressed in 2nd O.U.	$68,014,000 (capital) $2,282,000 (present worth O&M)
VI	Highlands Acid Pit, TX 06/25/84 1st	GW, soil, and sludge contaminated with VOCs, organics, and metals	Not specified	Excavation and offsite disposal of waste material; backfilling and seeding; and fencing	Not specified	$2,407,000 (capital) $14,100 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Highlands Acid Pit, TX 06/26/87 2nd–Final	Possible contamination of SW and GW with VOCs and metals	Not applicable	No further action with SW and GW monitoring	Contaminant concentration levels meet WQC and MCL requirements	$4,700 (capital) $11,120 (annual O&M) (year 1) $6,980 (annual O&M) (years 2-30)
VI	Industrial Waste Control, AR Industrial Landfill 06/28/88 1st	Soil, sediments, and GW contaminated with VOCs including toluene, organics, and metals including arsenic, chromium, and lead	Area C: 200 drums (liquid wastes) 16,900 yd^3 (soil) Area D: 3,000 drums (liquid wastes) 2,600 yd^3 (soil)	Installation of a french drain with a synthetic liner; excavation of Area D liquid-filled drums with offsite disposal; excavation and onsite stabilization of Area C and D soils with onsite disposal of residual matrix in Area C; categorization and disposal of solids and liquid wastes resulting from previous investigations; GW pump for offsite treatment, mix with contaminated soil and stabilized onsite, or treatment in an onsite facility with discharge to be determined during design; multilayer RCRA capping of area bound by french drain and northern site border; access and land use restrictions; and GW and site monitoring	MCLs for arsenic, cadmium, chromium, lead, and TCE are relevant and appropriate GW cleanup standards; however, the quantitative MCL goals were not specified. GW discharge and effluent limitations will be established by EPA and ADPCE. The stablized matrix will pass RCRA TCLP and/or other EPA-approved leachate test as well as the ASTM strength test	$11,400,000 (present worth)
VI	Koppers Texarkana, TX Wood Preserving Facility 09/23/88 1st	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, and xylene, metals including arsenic, and organics including PAHs and PCP	3,300 – 19,400 yd^3 (soil) 45,000,000 gals (GW)	Excavation of soil exceeding 100 mg/kg CPAHs with backfilling using clean soil, grading, placement of a sod cover, and washing contaminated soil with disposal in an onsite gravel pit or offsite hazardous waste disposal facility; collection and treatment of NAPLs at an onsite wastewater treatment plant using oil/water separation followed by either an activated carbon or fluidized carbon bed system, and recycling or incineration offsite of NAPLs, with reinjection of treated GW into the aquifer with excess GW discharged to SW or to an offsite treatment plant; excavation and treatment of drainage ditch sediments in the soil washing unit; deed and access restrictions; and GW monitoring	The soil cleanup goal is CPAHs 100 mg/kg, corresponding to a $3x10^{-5}$ risk factor. GW levels of free phase cresote will be remediated to a level of non-detection, and NAPLs will be removed to the maximum extent practicable	$6,400,000 (present worth) $300,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Mid-South, AR 11/14/86 1st	Soil, sediments, SW, and GW contaminated with organics including PAHs, and inorganics	45,750 yd^3	Excavation of soil with consolidation and capping; consolidation and stabilization of oils, liquids, or sludge; RCRA capping; backfilling, grading and seeding (or gravel cover) of all excavated areas; fencing; institutional controls to include deed restrictions; and GW pump and treatment using carbon filtration with discharge to SW	Cleanup goals for all media are based on Public Health Evaluation levels or concentrations that exceed background levels. Specific soil goals based on the 10^{-5} health-based risk level include total PAHs 3.0 mg/kg, arsenic 5.6 mg/kg, and chromium 19.4 mg/kg	$3,500,000 (capital) $153,500 (annual O&M)
VI	MOTCO, TX 03/15/85 1st	Soil and SW contaminated with organics including PCBs	Not specified	Offsite biological treatment of contaminated pit water; offsite TSCA incineration of organic liquids; and offsite RCRA disposal of sludges/tars and soils	Not specified	$42,300,000 (capital) O&M (not specified)
VI	North Cavalcade Street, TX Wood Preserving Facility 06/28/88 1st-Final	Soil, sediments, and GW contaminated with PAHs, and VOCs including benzene, toluene, and xylenes	22,300 yd^3 (soil) 5,600,000 gals	In situ biological treatment of soil (method will be selected after pilot testing); onsite GW pump and treatment using oil/water separation and carbon adsorption with reinjection and, if necessary, discharge into an onsite drainage ditch; and offsite incineration of all nonaqueous phase liquids (NAPLs) separated from the GW	Soil and GW cleanup levels will attain a cumulative 10^{-5} cancer risk level. Individual soil goals include PAHs 1 mg/kg and benzene 0.04 mg/kg. Individual goals for GW include benzene 5 ug/l (MCL), toluene 2,000 ug/l, and xylene 440 ug/l. Additionally, GW will be treated until all NAPLs are completely removed	$4,210,000 (present worth)
VI	Odessa Chromium I, TX 09/08/86 1st	GW contaminated with metals including chromium	Not specified	Negotiating agreements with Odessa City to extend water supply; and construction of water distribution system	Not specified	$247,920 (capital) $14,350 (annual O&M)
VI	Odessa Chromium I, TX Industrial Area 03/18/88 2nd-Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; demolition and disposal of building; and site monitoring	Treatment will eliminate chromium > 0.05 mg/l or the MCL promulgated prior to design	$2,836,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Odessa Chromium II, TX 09/08/86 1st	GW contaminated with metals including chromium	Not specified	Extension of municipal water service to affected areas	Not specified	$476,570 (capital) $51,375 (annual O&M)
VI	Odessa Chromium II, TX Industrial Area 03/18/88 2nd–Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; and site monitoring	Treatment will eliminate chromium > 0.05 mg/l or the MCL promulgated prior to design	$3,618,000 (present worth)
VI	Old Inger, LA 09/25/84 1st–Final	GW and soil contaminated with VOCs, pesticides, and metals	Not specified	Onsite land treatment of heavily contaminated soil and sludges; onsite containment and capping of slightly contaminated soils; closing and sealing ungrouted onsite well; GW pump and treatment; and fluid treatment with offsite discharge	Not specified	$3,174,000 (capital) $10,000 (annual O&M)
VI	Old Midland Products, AR Industrial Facility 03/24/88 1st–Final	Soil, sediments, sludge, and GW contaminated with organics including PCP and PNAs	9,000 – 21,000 yd^3 (soil) 850 yd^3 (sediments) 450,000 gals (GW) 620,000 gals (lagoon fluids)	Onsite incineration of contaminated surface soils, lagoon sludges and drainageway sediments with onsite disposal of residual ash; placement of a soil cover over ash and revegetation; and lagoon and GW collection and treatment using carbon adsorption	Soils with >1 mg/kg PCP will be excavated and incinerated in accordance with State standards. Soil will meet the 10^{-6} incremental cancer risk level. Treated GW will attain two cleanup levels: PCP 0.2 mg/l (MCL) and the 10^{-5} increased cancer risk for PNAs 28 ng/l (WQC)	$12,000,000 (present worth)
VI	Petro-Chemical Systems, TX 03/27/87 1st	Soil contaminated with VOCs, and organics including PAHs	4,000 yd^3	Excavation and temporary storage of soil in an onsite RCRA facility; construction of a road over excavated areas and existing roadway to provide access to site area; and temporary relocation of residents during excavation	Soil will be excavated to below PAHs 100.0 mg/kg or total volatiles 100.0 mg/kg	$1,232,785 (capital) $4,750 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	Sand Springs Petrochemical Complex, OK 09/29/87 1st	Soil, surface liquids, and sludges contaminated with VOCs, organics, and inorganics	130,000 yd^3 715,000 gal	Solidification/stabilization of sludges with containment in an onsite RCRA landfill; and excavation with offsite thermal destruction of remaining sludges. Second O.U. will address GW remediation	Chemical-specific cleanup levels not provided	$37,453,050 (capital) $15,000 (annual O&M)
VI	Sands Springs, OK Industrial Facility 06/28/88 2nd-Final	Soil and GW minimally contaminated with VOCs including benzene and TCE, and metals including arsenic, cadmium, chromium, and lead	Not specified	No action with long-term GW and SW monitoring; and implementation of institutional controls including site access restrictions	Nearby residential wells have not been affected and should not become affected based on the direction of GW flow, which is towards the river. In a worst case scenario, discharge from the site to the river would be 4.6 times less than NPDES regulatory standards	$9,300 (capital) $45,600 (annual O&M)
VI	Sikes Disposal Pits, TX 09/18/86 1st-Final	GW, soil, and SW contaminated with VOCs and organics	150,000 yd^3	Excavation and onsite incineration of sludges and soils with onsite disposal of residual ash; banning usage of onsite upper aquifer during natural attenuation; and SW treatment, as necessary, with discharge to river	Soil and sludges will be excavated to VOCs 10 mg/kg. The upper aquifer will be attenuated to 10^{-5} Human Health Criteria	$102,217,000 (capital) $41,000 (annual O&M)
VI	Sol Lynn, TX Industrial Facility 03/25/88 1st	Soil contaminated with PCBs	2,400 yd^3	Excavation of soil with alkali metal polyethylene glycolate (APEG) treatment and backfilling	The soil will be treated to attain the TSCA level for PCBs 25 mg/kg	$2,200,000 (present worth)
VI	Sol Lynn, TX Industrial Facility 09/23/88 2nd-Final	GW contaminatd with VOCs including TCE	12,000,000 gals (GW)	GW pump and treatment using air stripping, and activated carbon before emission to the air, if necessary, with discharge to a sanitary sewer or reinjected into the aquifer; and GW monitoring	GW cleanup will meet the MCL for TCE of 5 ug/l	$2,200,000 (present worth)

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	South Cavalcade Street, TX Wood Preserving Facility 09/26/88 1st-Final	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, and xylenes, metals including arsenic, chromium, and lead, and PAHs	30,000 yd^3 (soil) 50,000,000 gals (GW)	Excavation and onsite soil washing of 19,500 yd^3 of soil with replacement into excavated area, capping, and wash water treatment in GW treatment system; in situ soil flushing of 10,500 yd^3 of soil; GW pump and treatment of 50,000,000 gallons using physical/chemical separation, pressure filtration, and carbon adsorption with reinjection into the aquifer or, if necessary, discharge to the onsite drainage ditch which discharges to Hunting Bayou; offsite incineration or recycling of all non-aqueous phase liquids (NAPLs) separated out from the GW; GW monitoring; and deed restrictions	Soil cleanup will attain a cumulative 10^{-5} cancer risk level. Individual soil cleanup goals include CPAHs 700 mg/kg and no leaching potential. GW cleanup will attain a cumulative 10^{-4} cancer risk level for CPAHs. Other GW cleanup levels will attain Federal and State standards or background. Individual goals for GW include CPAHs 1 ng/l (no detection), benzene 5 ug/l (MCL), toluene 28 ug/l, xylene 440 ug/l, and arsenic, chromium and lead 50 ug/l (MCLs)	$13,000,000 (present worth)
VI	South Valley, NM 03/22/85 IRM	GW contaminated with organics	Not specified	Installation of a new water supply well	New water supply will meet the 10^{-6} cancer risk level by attaining 1,1-dichloroethane 0.25 ug/l, trichloroethene 2.8 ug/l, and tetrachloroethene 0.9 ug/l	$775,000 (capital) $12,000 (annual O&M)
VI	South Valley Edmunds Street Ground Water, NM Industrial Area 06/28/88 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with reinjection to the aquifer through infiltration galleries; and GW and air monitoring	GW will be treated to meet MCLs and New Mexico Water Quality Control Commission Regulations including PCE 20 ug/l (NMWQCC) and TCE 5 ug/l (MCL)	$874,800 (present worth) $280,200 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	South Valley/ SJ-6, NM Industrial Area 09/30/88 3rd	Well sediments and GW contaminated with VOCs including PCE and TCE	100 ft (well sediment)	Cleaning (excavation of well sediment) and sealing abandoned wells; GW monitoring; and access restrictions	Remedy addresses prevention of contaminant dispersal, thus individual cleanup goals are not applicable. EPA actions involving source control and contaminant plume remediation on adjacent sites will reduce the low concentrations to below State health criteria within 5 years. Federal health criteria are already being attained	$4,000,000 (present worth) $300,000 (annual O&M)
VI	South Valley/ (PL-83), NM Industrial Area 09/30/88 4th	Soil and GW contaminated with VOCs including PCE, organics and metals	36,000 yd^3 (soil)	Soil vapor extration with carbon adsorption treatment of effluent air; GW pump and treatment using air stripping, carbon adsorption, and chemical/physical treatment (if necessary), with reinjection into the aquifer; further sampling and definition of soil and GW contamination; and GW monitoring	Soil will be treated until the vapor extraction system ceases to extract VOCs; GW cleanup will meet MCLs and State WQC. Individual contaminant goals were not specified.	$1,820,000 (present worth of soil remediation; figures for GW remedial action not provided)
VI	Stewco, TX Industrial Facility 09/16/88 1st-Final	No threat	None	No further action	Not specified	$5,000 (capital - for plugging 16 wells)
VI	Tar Creek, OK 06/06/84 1st-Final	GW, SW, and sediments contaminated with acidic waste water, metals, and organics	Not specified	Diversion and diking at two major inflow areas; and plugging of 66 wells	Not specified	$4,000,000 (capital) $5,000 (annual O&M)
VI	Triangle Chemical, TX 06/11/85 1st-Final	Soil contaminated with VOCs	Not specified	Incineration and deep well injection of the tank and drum contents; mechanical aeration of contaminated soils; decontamination of all onsite structures; and offsite disposal of trash and debris	Soil will be aerated to background levels	$385,000 (capital) $500 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VI	United Creosoting Site, TX 09/30/86 1st	Soils contaminated with VOCs, organics including PCP and PAHs, and inorganics including creosote	84,000 yd^3	Demolition and purchasing of 6 homes with provision for permanent relocation of residents; onsite consolidation of surface soil with temporary capping; excavation and disposal of PAH contaminated soils at appropriate facility or treatment, if available; backfilling and covering; and natural GW attenuation	Excavation and disposal of all soils contaminated above PAH 100 mg/kg	Capital (undeveloped) $43,000 (interim closure period) (annual O&M)
VI	United Nuclear Corporation, NM Waste Disposal/ Mining Facility 09/30/88 1st	GW contaminated with radiological and nonradiological constituents including arsenic, cadmium, cobalt, nickel, radium – 226/228, selenium, and gross alpha	Not specified	Implementation of a GW monitoring program; GW pump and treatment using existing or new extraction wells to control and remove tailings seepage with discharge to an evaporation disposal system; and implementation of a performance monitoring and evaluation program	GW cleanup levels will attain MCLs or State Water Quality Act standards (or background levels where these are higher). Individual cleanup goals include arsenic 50 ug/l (MCL), cadmium 10 ug/l (MCL), cobalt 50 ug/l (NMWQA), nickel 200 ug/l (NMWQA), radium–226/228, 5 pCi/L (MCL), selenium 10 ug/l (MCL), and gross alpha 15 pCi/L (MCL)	$17,000,000 (present worth) $1,000,000 (annual O&M)
VII	Aidex, IA 08/24/83 IRM	GW and soil contaminated with VOCs and pesticides	Not specified	Offsite disposal of bulk liquids and semi-solids by deep well injection; and onsite drainage control	Not specified	$3,580,175 (present worth) O&M (not specified)
VII	Aidex, IA 09/30/84 2nd–Final	GW and soil contaminated with VOCs and pesticides	Not specified	Excavation and offsite disposal of buried wastes and contaminated soil; backfilling, grading, and seeding of the site; expansion of the monitoring well network and biannual GW testing; and vacuuming and washing interior surfaces, floors, and walls of the onsite building	Not specified	$3,455,175 (capital) $875,000 (annual O&M)
VII	Arkansas City Dump, KS Industrial Facility/ 160–acre Municipal Landfill 09/29/88 1st	Sludge contaminated with organics including PAHs, and sulfuric acid	1,300,000 ft^3 (sludge)	In situ neutralization of the acid sludge waste, followed by construction of a soil cover over the waste area; institutional controls including deed restrictions; GW monitoring; and completion of feasibility study addressing the subsequent sediment and GW operable unit	Neutralization of acid sludge (pH < 2.0) will eliminate the potential for sulfur dioxide emissions	$947,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Big River Sand Company, KS Waste Disposal Area 06/28/88 1st-Final	Metals and VOCs present in soil and GW do not pose a significant health threat	Not specified	No action remedy	Metals in the soil and GW are not outside the range of metals found naturally occurring in soil and GW. Additionally, no MCLs are being exceeded in onsite or offsite drinking water wells	$5,800 (future cost if sampling conducted in 5 years)
VII	Cherokee County/ Galena, KS Mining District 12/21/87 1st	GW contaminated with metals	Not specified	Provision of an alternate water supply to residences, businesses, and farms; and chlorination rehabilitation of two wells	The goal of this remedial action is to meet the primary MCLs. The water will need no treatment other than chlorination to achieve these levels	$5,300,000 (present worth) $100,000 (annual O&M)
VII	Conservation Chemical, MO 09/30/87 1st-Final	Soil and GW contaminated with VOCs, organics, pesticides, metals, and inorganics	Not specified	Capping; GW pump and treatment; and decontamination and destruction of onsite structures	Cleanup goals are based on 10^{-6} health-based risk level targets. MCL levels to be attained include arsenic 50.0 ug/l, cadmium 10.0 ug/l, total chromium 50.0 ug/l, lead 50.0 ug/l, TCE 5.0 ug/l, benzene 5.0 ug/l, vinyl chloride 2.0 ug/l, and chloroform 0.19 ug/l. AWQC cleanup levels to be met include nickel 13.9 ug/l and zinc 5,000.0 ug/l	$8,626,000 (capital) $12,774,111 (present worth O&M)
VII	Deere, John Dubuque Works, IA Industrial Facility 09/29/88 1st-Final	GW contaminated with VOCs including benzene, PCE, toluene, and TCE	Not specified	Extraction and offsite discharge of GW; continue GW extraction and collection of NAPLs from well-3, with offsite disposal of NAPLs; provision of an alternate water supply; deed restrictions; and implementation of a contingency plan to contain migration if plant shuts down	Discharged GW will meet NPDES guidelines. GW treatment will meet MCLs and EPA Health Advisories, and withdraw the maximum amount of NAPLs. Individual cleanup goals were not specified	$5,151,800 (present worth) $276,600 (annual O&M)
VII	Des Moines TCE, IA 07/21/86 1st	GW contaminated with VOCs including TCE, and organics	Not specified	GW pump and treatment with discharge to SW	Extraction and treatment will continue until maximum TCE concentration in monitoring wells is 5 ug/l or less, for 4 consecutive months	$1,196,000 (capital) $63,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Ellisville, MO 07/10/85 1st	Soil and SW contaminated with VOCs, organics, and pesticides	Not specified	Callahan Property: stabilization and erosion control; removal and disposal of plastic cover and cover's hold-down blocks; removal and salvaging of the barbed-wire and chain link fences; and gravel removal	Not specified	$12,000 (capital) O&M (not specified)
				Rosalie Property: excavation and offsite disposal of contaminated soil, drums, cans, and other debris; and soil testing and analysis	Not specified	$52,000 (capital) O&M (not specified)
VII	Ellisville, MO 09/29/86 2nd	Soil contaminated with VOCs, dioxins, and metals	Not specified	Excavation and onsite interim storage of dioxin contaminated soil; and excavation, transportation, and offsite land disposal of soils containing nondioxin waste	Not specified	$20,200,000 (present worth) O&M (not specified)
VII	Fulbright/Sac River Landfill, MO 98 and 114-Acre Municipal Landfills 09/30/88 1st-Final	Soil, sediments, GW, and SW contaminated with low levels of unspecified wastes	Not specified	Removal and offsite treatment or disposal of drum and drum remnants east of Fulbright Landfill; GW, SW, and leachate monitoring; and deed restriction	Not specified	$246,600 - $270,400 (present worth)
VII	Hastings Ground Water/Colorado Avenue, NE Industrial Facility 09/28/88 1st	Soil contaminated with VOCs including TCE and PCE	42,700 yd^3 (soil)	In situ soil vapor extraction with activated carbon treatment of extracted vapor, if necessary; and soil, GW and air monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$3,603,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Hastings Ground Water/ FAR-MAR-CO, NE Industrial Facility 09/30/88 2nd	Soil contaminated with carbon tetrachloride and ethylene dibromide	33,800 yd^3 (soil)	In situ soil vapor extraction with treatment of extracted vapor using activated carbon, if necessary; access restrictions; and soil, air, and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$2,526,000 (present worth)
VII	Midwest Manufacturing/ North Farm, IA Waste Disposal Facility 09/30/88 1st	Soil contaminated with metals including cadmium and cyanide	200 yd^3 (soil)	Excavation of contaminated soil with either onsite or offsite stabilization, followed by offsite disposal; and backfilling and grading of the excavated area to support a vegetative cover	Soil cleanup will attain the health-based action level for cadmium of 13 mg/kg. Soil will be stabilized to the extent that the leachate contaminant concentration, as measured by the TCLP, meets the Land Disposal Regulations standards for F006 nonwastewaters. These standards are cadmium 0.006 mg/l, total chromium 5.2 mg/l, lead 0.51 mg/l, nickel 0.32 mg/l, silver 0.072 mg/l	$140,000 - $170,000 (present worth)
VII	Minker Stout/ Romaine Creek, MO 09/28/87 2nd	Soil and sediments contaminated with pesticides including TCDD	4,400 yd^3	Excavation and temporary storage of soil and sediments in an onsite RCRA facility; and backfilling of excavated areas with clean soil	Soil and sediments will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 feet or once bedrock is reached	$4,488,000 (present worth) $28,000 (annual O&M)
VII	Minker Stout/ Stout, MO 09/28/87 3rd	Soil contaminated with pesticides including TCDD	3,500 - 5,700 yd^3	Excavation and temporatory storage of soil in an onsite RCRA facility; backfilling of excavated areas with clean soil; and institutional controls to include site assess restrictions	Soil will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 feet or once bedrock is reached	$5,817,000 - 7,018,000 (present worth) $6,000 (annual O&M)
VII	Minker/Stout/ Romaine Creek, MO Residential Area 09/29/88 2nd	Soil contaminated with dioxin	12,000 yd^3 (soil)	Excavation and offsite thermal treatment at Times Beach facility of soil exceeding 20 ug/kg dioxin including soil in temporary storage, with offsite residual disposal also at Times Beach; and capping of areas contaminated with dioxin not exceeding 20 ug/kg	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5-10 ug/kg dioxin at a depth of one foot or greater.	$48,800,000 (capital) (includes costs from Times Beach site)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VII	Shenandoah Stables, MO 09/28/88 1st	Soil and structures contaminated with dioxins	3,300 yd^3 (soil)	Excavation of dioxin-contaminated soil with backfilling of excavated areas, placement of waste material in polypropylene bags, and storage of bags in a RCRA-equivalent onsite structure; and decontamination of onsite structures	Soil cleanup will remove surface soils exceeding a dioxin concentration of 1 ug/kg until a residual concentration of 5 to 10 ug/kg is reached or to a maximum depth of 4 feet based on health-based action levels provided by ATSDR	$3,936,500 (present worth)
VII	Syntex Verona, MO Chemical Facility 05/05/88 1st	Soil contaminated with dioxin	860 yd^3 (soil)	Excavation and offsite thermal treatment of all dioxin-contaminated soil exceeding 20 ug/kg, followed by offsite disposal of residual ash; dismantling and decontamination of contaminated equipment with a series of solvents and aqueous rinses; installation of a clay cap and vegetative cover over the Trench Area; and maintenance of vegetative cover over surface soil containing more than 1 ug/kg dioxin	Soil cleanup will attain the site-specific action level of 20 ug/kg	$5,617,000 (present worth)
VII	Times Beach, MO (Interim Storage Facility) 01/13/84 1st	Soil contaminated with dioxin	Not specified	Transportation of highly contaminated soil from other sites for storage in an onsite interim storage facility (to be constructed); and restoration of other sites by excavation and temporary relocation of affected residents	Not specified	$15,734,000 (capital) O&M (not specified)
VII	Times Beach, MO Residential Area 09/29/88 2nd	Soil contaminated with dioxin	13,600 yd^3 (soil) 105,000 yd^3 (debris)	Demolition and onsite disposal of all structures; excavation and thermal treatment of dioxin-contaminated soil exceeding 20 ug/kg with onsite residual disposal; capping of areas contaminated with dioxin not exceeding 20 ug/kg; and construction of a ring levee for flood protection of temporary thermal treatment unit	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5–10 ug/kg dioxin at a depth of one foot or greater.	$48,800,000 (capital) (includes costs from Minker/ Strout Romaine Creek site)
VIII	Anaconda Smelter, MT Smelter Facility/ 160-Acre Mill Creek Community 10/02/87 1st	Air contaminated with metals including arsenic, cadmium, and lead	Not specified	Relocation of all remaining residents (8 homes) with temporary erosional stabilization using a vegetative soil cover; demolition, consolidation, and temporary onsite storage of debris; implementation of institutional controls including deed and access restrictions; and site maintenance	Risk-based performance goals for arsenic and cadmium appear technically unattainable and were less than background levels. Consequently, background levels for arsenic 0.01 ug/m^3 and cadmium 0.01 ug/m^3 will be met. The NAAQS for lead 1.5 ug/m^3 also will be met	$300,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	Broderick Wood Products, CO Wood Preserving Facility 06/30/88 1st	Soil, sludge, oil, and wastewater contaminated with VOCs including benzene, organics including PAHs, PCPs, and dioxins, and metals including arsenic and lead	31,000 yd^3 (soil) 3,000 gals (oil) 3,600 yd^3 (sludge) 560,000 gals (wastewater)	Implementation of site access restrictions; excavation and onsite incineration of sludge and oil with offsite disposal of ash residues; excavation of visibly contaminated soils with either onsite incineration (<2,500 yd^3) or onsite storage (>2,500 yd^3); wastewater filtering and treatment using carbon adsorption with onsite discharge or use in the incineration process; and GW monitoring	Disposal of residue ash will meet BDAT treatment standards which include napthalene 7.98 mg/kg, phenanthrene 7.98 mg/kg, pyrene 7.28 mg/kg, toluene 0.143 mg/kg, and xylenes 0.162 mg/kg. Wastewater contaminants will be treated to nondetectable levels to comply with State standards. If these levels cannot be met, State standards will be waived and contaminants will be treated to MCLs	$2,264,000 – $3,603,200 (present worth)
VIII	California Gulch, CO Mining District 03/29/88 1st–Final	SW, sediments, and GW contaminated with metals including cadmium, copper, lead, and zinc	210 tons (waste discharged per year)	Construction of surge ponds at Yak Tunnel portal; construction of concrete plugs at three tunnel locations; sealing of shafts and drill holes; diversion of surface water away from tunnel recharge areas and grouting of highly fractured rock; implementation of a monitoring network to detect leakage, seeps, or GW migration; and installation of pump and interim treatment should surface seepage occur	This operable unit invokes an interim remedy waiver	$11,982,770 (capital) $460,307 (annual O&M)
VIII	Central City/ Clear Creek, CO 09/30/87 1st	Possible contamination of sediments, and downstream SW and GW with inorganics	Not specified	Passive/active treatment system for acid mine drainage discharge	Interim remedy. ARARs will be determined in future O.U.	$1,663,000 (capital) $511,000 (annual O&M)
VIII	Central City/ Clear Creek, CO Mining District 03/31/88 2nd	Soil and SW contaminated with metals	Not specified	Slope stabilization at Big Five Tunnel and Gregory Incline; and runon controls at all five tailings and waste rock piles	Final ARAR determinations will be addressed in the final operable unit	$1,049,600 (present worth) $20,992 (annual O&M)

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	Denver Radium I (12th & Quivas), CO 09/29/87 4th	Soil contaminated with radium and its decay products	11,000 yd^3	Placement of cap over open 7,600 yd^3 of soil contamination; excavation of contaminated soil under several structures with temporary onsite storage (3,400 yd^3); maintenance of cap and storage area until a facility for permanent disposal becomes available; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$3,702,800 (present worth) $290,000 (present worth O&M)
VIII	Denver Radium II (11th & Umatilla), CO 09/29/87 5th	Soil and debris contaminated with radium and its decay products	15,400 yd^3	Excavation of contaminated soil with temporary onsite storage; decontamination of 11 ft^2 of roof and placement in onsite storage facility; maintenance of existing cap and onsite land storage facility until a facility for permanent disposal becomes available (15,400 yd^3); and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$4,230,300 (present worth) $194,700 (present worth O&M)
VIII	Denver Radium III (1,000 West Louisiana), CO 09/30/87 6th	Soil and debris contaminated with radium and its decay products	Not specified	Onsite temporary containment of contaminated material followed by offsite permanent disposal when available; cleanup of the Creative Illumination property; and dismantling of temporary storage facility with offsite disposal; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level averaged more than 5 pCi/g, over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$2,172,800 (capital) $305,800 (present worth O&M)
VIII	Denver Radium/ Card Property, CO 06/30/87 3rd	Soil, sediment, and debris contaminated with radium and its decay products	4,000 yd^3	Excavation of 4,000 yd^3 soil and sediment with temporary onsite storage and final offsite disposal; and decontamination and dismantling of buildings with offsite disposal	Radium-226 in land average over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$1,148,000 (present worth) $89,500 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	Denver Radium/ Open Space Property, CO 09/29/87 7th	Soil contaminated with radium and its decay products	1,310 yd^3	Onsite temporary containment of 290 yd^3 material followed by offsite permanent disposal; removal of 1,020 yd^3 of material with placement in containers followed by offsite disposal when available; and dismantling of temporary storage facility with offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed backgroung level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$955,400 (present worth)
VIII	Denver Radium/ ROBCO, CO 09/30/86 2nd	Soil and buildings contaminated with radium	7,000 yd^3 (soil) 200 yd^3 (demolished buildings)	Excavation and offsite disposal of contaminated soils and debris; or Excavation, stabilization and temporary onsite consolidation of contaminated soils	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$1,912,400 (capital) $6,000 (annual O&M)
VIII	Denver Radium Site Streets, CO 03/24/86 1st	Asphalt contaminated with radium	38,500 yd^3	Temporary leaving of contaminated material in place; institutional controls; and routine maintenance	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$30,000 (capital) Annual O&M (variable)
VIII	Libby Ground Water, MT 09/26/86 1st	Soil and GW contaminated with organics including creosote, and inorganics	Not specified	Alternate water supply; and controls prohibiting well usage	Not specified	PRP responsibility
VIII	Marshall Landfill, CO 09/26/86 1st-Final	GW and SW contaminated with VOCs including TCE and PCE, organics, and metals	Not specified	Installation of a subsurface collection system; GW treatment using sedimentation, air stripping, and off-gas carbon adsorption; regrading and revegetating; and fencing	Contaminated water will be treated to achieve removal of benzene 0, TCE 0, cadmium 0.6 mg/l, and lead 4 mg/l	$1,819,000 (capital) $152,000 (annual O&M)
VIII	Milltown, MT 04/14/84 1st	GW and soil contaminated with metals including arsenic	Not specified	Construction of a new well and distribution system; and flushing and testing residential plumbing systems	GW will be treated to EPA drinking water standards for arsenic 0.050 mg/l	$262,714 (capital) $4,238 (annual O&M)
VIII	Milltown, MT 08/07/85 2nd	GW and soil contaminated with metals including arsenic	Not specified	Replacement of household water supply appurtenances; and on-going testing of residential plumbing systems	Not specified	Not specified

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
VIII	North Dakota Arsenic Trioxide, ND 09/26/86 1st-Final	GW contaminated with metals including arsenic	Not specified	Expansion and hook-up of homes to GW treatment and distribution system; and evaluation of possible institutional controls	Water supplied for domestic and agricultural purposes will attain the MCL for arsenic 25 ug/l	$2,212,600 (capital) $57,400 (annual O&M)
VIII	Rocky Mountain Arsenal, CO 06/04/87 1st	GW contaminated with VOCs including TCE, and inorganics	Not specified	Construction of granular activated carbon (GAC) water treatment system and regeneration of spent carbon at another location; modification of GAC system, if necessary, to include air stripping facility to treat vinyl chloride; replacement of existing well pumps and motors; installation of transmission piping; and construction of laboratory and office space	Treatment will attain the MCLs which include 1,1-dichloroethylene 0.007 mg/l, TCE 0.005 mg/l, PCE 0.005 mg/l, TCA 0.200 mg/l, trans-1,2 - dichloroethylene 0.005 mg/l, and vinyl chloride 0.001 mg/l	$8,869,000 or $10,100,000 (with air stripping) (capital) $372,000 (annual O&M)
VIII	Smuggler Mountain, CO 09/26/86 1st	GW and soil contaminated with metals including cadmium and lead	410,000 yd^3	Excavation and permanent onsite RCRA disposal of soils; soil capping; and alternate water supply	Excavation and onsite isolation of soil with lead greater than 5,000 mg/kg. Soils between 1,000-5,000 mg/kg will be covered with 6-12 inches of topsoil. GW will be monitored to comply with SDWA Standards	$1,816,550 (capital) $30,900 (annual O&M)
VIII	Union Pacific Railroad, WY 09/26/86 1st	GW and soil contaminated with organics including PCBs and creosote, and inorganics	Greater than 700,000 yd^3	Rechanneling of river; GW pump and treatment with carbon adsorption with discharge to river; and slurry wall barrier construction	Not specified	$7,000,000 (capital) $57,000 (annual O&M)
VIII	Woodbury Chemical, CO 07/19/85 1st	GW, soil, and sediments contaminated with pesticides, metals, and organics	Not specified	Excavaton, offsite transportation, and incineration of highly contaminated rubble and soil with disposal of residual ash; and backfilling with clean soil, regrading, and revegetation	Contaminated soils will be treated to 3 mg/kg and contaminated rubble to total pesticides 100 mg/kg	$2,450,000 (capital) $21,000 (annual O&M)
IX	Celtor Chemical, Works, CA 10/04/83 IRM	GW, SW, and soil contaminated with metals and mining waste	Not specified	Offsite transportation and disposal of tailing piles and contaminated soil; and conduct of RI/FS	Not specified	$340,000 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Celtor Chemical, CA 09/30/85 2nd-Final	SW and soil contaminated with metals including cadmium and arsenic	Not specified	Excavation and RCRA offsite disposal of contaminated soils	Action levels for soil will be based on National Water Quality Criteria. SW and GW will be based on MCLs or DWRs. River criteria will be based on standards for the protection of aquatic life	$3,065,338 (capital) $7,000 (annual O&M)
IX	Del Norte, CA 09/30/85 1st-Final	GW and soil contaminated with VOCs, pesticides, and metals including chromium	700 yd^3	Excavation and removal of soil; GW treatment with discharge to POTW; and disposal of chromium-rich waste brine to RCRA facility	Cleanup levels will meet the 10^{-6} cancer risk level and MCLs under SDWA	$1,240,000 (capital) $0 (O&M)
IX	Indian Bend Wash, AZ Industrial/ Residential Area 09/21/88 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with air emission controls, followed by distribution of the treated water to the municipal water system	GW cleanup will attain MCLs and State action levels. Individual goals include TCE 5 ug/l (MCL), TCA 200 ug/l (MCL), DCE 7 ug/l (MCL), and PCE 0.67 ug/l	$8,728,000 (present worth) $520,000 (annual O&M)
IX	Iron Mountain, CA 10/03/86 1st	SW runoff from mountain contaminated with acid mine drainage consisting of sulfuric acid and metals; fish and sediment are also affected	2.5 acres (to be capped)	Capping of selected cracked and caved enlargement	Cleanup program will be designed for Protection of Aquatic Life for the "worst case" condition of 1978	$68,100,000 (fund-balanced cost) (capital) $4,100,000 (present worth O&M)
IX	Jibboom Junkyard, CA 05/09/85 1st-Final	Soil contaminated with VOCs, metals including lead, zinc, and copper, and organics including PCBs	Not specified	Excavation and offsite disposal of contaminated soils	Soils containing lead above 500 mg/kg will be excavated	$1,460,000 (capital) O&M (not specified)
IX	Litchfield Airport, AZ 09/29/87 1st	GW contaminated with VOCs including TCE, and inorganics	Not specified	GW pump and treatment using air stripping and granular activated carbon with reinjection into aquifer	GW treatment will meet MCLs which include 1,1-dichloroethylene 7.0 ug/l, carbon tetrachloride 5.0 ug/l, chromium 50.0 ug/l, and arsenic 50.0 ug/l. Chloroform will meet the WQC of 5.0 ug/l	$2,358,500 (capital) $800,200 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Lorentz Barrel and Drum, CA Waste Disposal Facility 09/25/88 1st	GW contaminated with VOCs including benzene, PCE, and TCE, and other organics including PCBs and pesticides, and metals including arsenic	Not specified	GW pump and treatment using an ozone/UV treatment system, and on exchange, if necessary, with discharge to a local creek	GW cleanup levels will meet MCLs and NPDES discharge limits. Individual goals include benzene 5 ug/l (MCL), PCE 5 ug/l (NPDES), and arsenic 0.23 ug/l. PCBs and pesticides will be removed to detection limits	$3,238,000 (present worth) $198,000 (annual O&M)
IX	McColl Site, CA 04/11/84 1st	Soil contaminated with VOCs and inorganics including sulfur dioxide, hydrogen sulfide, and arsenic	Not specified	Excavation and offsite disposal of wastes and soil	Not specified	$21,500,000 (capital) $0 (O&M)
IX	MGM Brakes, CA Industrial Facility 09/29/88 1st-Final	Soil, sediments, GW, SW, air, and debris contaminated with PCBs and VOCs	13,510 yd^3	Dismantling of the process building; crushing and removal of concrete slab, and excavation of soil and sediments contaminated with PCBs at concentrations equal to or greater than 10 mg/kg with offsite disposal, followed by backfilling, regrading and revegatation; GW pump and treatment with discharge to a POTW; offsite GW and soil monitoring to determine extent of VOC contamination; and additional remedial measures for GW, if necessary	Soil cleanup level is 10 mg/kg for PCBs based on EPA's National PCB Spill Cleanup Policy. GW cleanup will ensure a 10^{-6} risk level at the site boundary	$5,369,300 (capital) $0 (O&M)
IX	Motorola 52nd Street, Facility AZ Industrial Facility 09/30/88 1st	Soil and GW contaminated with VOCs including 1,1,1-TCA, and metals	Not specified	Soil-gas extraction and treatment onsite; GW pump and treatment of on- and offsite GW with treatment onsite and treated GW used in site manufacturing processes	GW cleanup will meet relevant State/Federal standards and control contaminant migration. Individual cleanup goals were not provided	$7,600,000 (present worth) $700,000 (annual O&M)
IX	Mountain View/Globe, AZ 06/02/83 1st-Final	Soil contaminated with asbestos	Not specified	Permanent relocation of residents; onsite burial of containerized mobile homes; and fencing	Not specified	$4,432,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Operating Industries, CA 07/31/87 1st	Leachate contaminated with VOCs including TCE	Not specified	Site control (operation and maintenance of existing systems) to include gas well probes and leachate pumping and collection	Interim Remedy. ARARs will be determined in future O.U.	$5,100,000 (present worth)
IX	Operating Industries, CA 190-Acre Municipal Landfill 11/16/87 2nd	Leachate contaminated with VOCs and organics	Not specified	Onsite treatment of leachate and other collected hazardous liquids using air stripping and carbon adsorption with discharge to the sewer system; and construction of a treatment facility	Leachate will be treated to achieve the LASCD discharge requirements. Individual effluent discharge limits include vinyl chloride 0.013 mg/l, oil and grease 10 mg/l, and total toxic organics 1.0 mg/l. The site will achieve the 10^{-6} health-based risk level	$1,900,000 (capital) $700,000 (annual O&M)
IX	Operating Industries, CA 190-Acre Municipal Landfill 09/30/88 3rd	Air contaminated with methane and VOCs including benzene, PCE, TCE, and toluene	Not specified	Installation of new and use of existing LFG extraction wells; installation of new integrated perimeter and interior LFG headers; installation of multiple completion monitoring wells at the property boundary; installation of LFG destruction facilities; installation of above grade condensate pumps to collect condensate from gas headers, leachate pumps in gas wells and abovegrade leachate sumps with pretreatment of collected leachate and condensate to POTW requirements	Remedy will attain the State ambient air quality standard for vinyl chloride of 10 ppb for a 24-hour period. Additional goals include carbon monoxide 2,000 ppm, sulfin dioxide 500 ppm, and methane concentrations to less than 5 percent of the landfill boundary	$73,000,000 (present worth) $2,340,000 (annual O&M)
IX	Ordot Landfill, Guam 47-Acre Municipal Landfill 09/28/88 1st-Final	Not applicable	None	No action remedy with continued site monitoring	Not applicable	$0
IX	San Fernando Valley, CA 09/24/87 1st	Area-wide GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using aeration and granular activated carbon-air filtering units with discharge to pumping station for chlorination and distribution; and disposal or regeneration of spent carbon	GW treatment will meet the MCL for TCE 5.0 ug/l and the State Action level for PCE 4.0 ug/l	$2,192,895 (capital) $2,284,105 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	San Gabriel/Area I, CA 05/11/84 IRM	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using air stripping; and conduct of RI/FS	Not specified	$525,000 (capital) $38,000 (annual O&M)
IX	San Gabriel, CA 09/30/87 1st	GW contaminated with VOCs including PCE	Not specified	Well discharge treatment using activated carbon adsorption; and alternate water supply	Cleanup goals will reduce PCE below the detection limit of 1.0 ug/l for purgable halocarbons	$1,616,000 - $1,771,800 (capital) $181,400 - $303,100 (annual O&M)
IX	San Gabriel Valley Areas 1, 2, and 4 Private Utility's Well Field 09/29/88 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	Onsite GW pump and treatment using an air stripping system equipped with air emissions controls, with residual discharge to the utility's water distribution system; floodproofing treatment facility; and GW monitoring	GW treatment will attain a cumulative 10^{-6} cancer risk level and meet MCLs for TCE 5 ug/l and DCE 7 ug/l, and State action levels. This will be attained by remediating PCE to below 1.0 ug/l	$13,052,000 (present worth) $7,623,000 (present worth O&M)
IX	Selma Pressure Treating Company, CA Industrial Facility 09/24/88 1st-Final	Soil and GW contaminated with organics including dioxin/furan and phenols, and metals including arsenic chromium	16,100 yd^3 2,700,000 gals	GW pump and treatment using precipitation, coagulation, and flocoulation with reinjection to the aquifer or offsite discharge; soil excavation, fixation, and replacement into excavated areas followed by construction of a RCRA cap; GW and soil monitoring; and access and land use restrictions and institutional controls on GW use	Soil cleanup will meet the risk-based levels of dioxin/furan 1.0 ug/kg and arsenic 50 mg/kg. GW cleanup will meet the State MCL for chromium of 50 ug/l	$11,280,00 (present worth) $1,300,000 (annual O&M)
IX	South Bay Asbestos, CA Residential Area Levee 09/29/88 1st-Final	Levee soil contaminated with asbestos	Not specified	Stripping and rough grading of levee followed by soil cover and revegetation; implementation of erosion control measures; and deed restrictions	No specific goals specified	$2,374,700 (present worth) $19,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
IX	Stringfellow Acid Pits, CA 07/22/83 IRM	GW, SW, and soil contaminated with metals and organics	Not specified	Fencing; cap maintenance; and offsite leachate disposal	Not specified	$2,406,000 (present worth) O&M (not specified)
IX	Stringfellow Acid Pits, CA 07/17/84 1st	GW contaminated with pesticides, metals, and organics	Not specified	GW pump and treatment with offsite discharge to POTW	Not specified	$9,189,000 (capital) $1,724,000 (annual O&M)
IX	Stringfellow Acid Pits, CA 06/25/87 2nd	GW contaminated with VOCs including TCE, organics, inorganics, and metals	Not specified	GW pump and treatment with possible discharge to POTW; and SW diversion/collection with discharge to creek	GW treatment will meet SAWPA limitations for discharge of arsenic 2.0 mg/l, cadmium 0.064 mg/l, chromium 2.0 mg/l, lead 0.58 mg/l, total toxic organics (excluding PCBs and pesticides) 0.58 mg/l, and PCBs and pesticides 0.02 mg/l	$1,047,000 - $1,136,000 (capital) $1,243,000 - $1,408,000 (annual O&M)
IX	Taputimu Farm/ Insular Territories, AS 12/27/83 1st–Final	Air contaminated with VOCs, and organics including PCBs and pesticides	Not specified	Repacking of chemical/pesticide materials stored onsite; decontamination and sealing of onsite storage facilities; and transportation of all waste materials to mainland for offsite disposal	Not specified	$0
IX	Tucson International Airport Area, AZ Industrial Area/Landfill 08/22/88 1st	GW contaminated with VOCs including TCE, benzene, and xylenes	Not specified	GW pump and treatment of areas A and B using air stripping with treatment of emissions by GAC, if necessary, and discharge to the municipal water distribution system	GW cleanup levels will attain an overall excess cancer risk level of 10^{-6} by remediating TCE to 1.5 ug/l, thereby reducing the levels of other contaminants below their respective MCLs, State Action Levels, and 10^{-6} excess cancer risk concentrations	$7,328,000 - $7,820,000 (present worth) $393,000 - $450,900 (annual O&M)
X	Colbert Landfill, WA 09/29/87 1st–Final	GW contaminated with VOCs, including TCE and PCE	Not specified	Installation and operation of interception and extraction wells with onsite GW treatment; and provision of an alternate water supply	Cleanup goals based on MCLS include TCA 200.0 mg/l, DCE 7.0 ug/l, TCE 5.0 ug/l, and DCA 4,050.0 ug/l. Methylene chloride 2.5 ug/l and PCE 0.7 ug/l are based on the 10^{-6} cancer risk level	$24,000,000 (present worth)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
X	Commencement Bay (Near Shore), WA Industrial Area 12/30/87 1st	Soil and SW contaminated with VOCs including benzene, organics including PAHs and PCBs, and metals including lead	45,000 yd^3	Excavation and stabilization of soils exceeding one percent total PAHs; excavation and stabilization of all surface soils exceeding 10^{-6} lifetime cancer risk; removal and stabilization of ponded water; onsite disposal of treatment residuals; asphalt capping of stabilized matrix; SW diversion; GW monitoring; and implementation of institutional controls including land and water use restrictions	Surface soil and sediments exceeding the 10^{-6} health-based risk level will be treated. Individual goals include PCB 1 mg/kg, PAHs 1 mg/kg, benzene 56 mg/kg, and lead 166 mg/kg (acceptable dose). GW cleanup will attain lead 50 mg/l (MCL), benzene 0.53 mg/l (WQC), PCBs 0.2 mg/l (WQC), and PAHs 5-30 ug/l (WQC)	$3,400,000 (present worth)
X	Commencement Bay/Tacoma, WA 190-Acre Industrial/ Municipal Landfill 03/31/88 1st-Final	Soil and GW contaminated with VOCs including benzene, toluene and xylenes, organics and metals including chromium	Not specified	Installation of landfill cap with gas extraction system; GW pump and treatment with offsite discharge to a creek or the sanitary sewer; installation of alternate water supply if needed; and GW monitoring	GW cleanup levels were provided for 10 contaminants of concern based on MCLs, WQC, pretreatment standards, or risk assessments. Individual goals include benzene 5 ug/l (MCL), toluene 14 ug/l (WQC), and xylenes 10 ug/l (risk assessment)	$21,015,000 - $23,418,000 (present worth)
	Frontier Hard Chrome, WA Industrial Facility 12/30/87 1st	Soil and structures contaminated with metals including chromium	7,400 yd^3 (soil)	Excavation of soil and onsite treatment using chemical stabilization with replacement of the treated materials; demolition of site buildings; and placement of a final site cover	Soils with chromium in excess of 550 mg/kg will be treated. There is presently no soil standard for chromium. Testing determined that soils < 500 mg/kg would not release chromium to the GW at levels above the drinking water standard of 0.05 mg/l	$2,000,000 (present worth)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
X	Frontier Hard Chrome, WA Industrial Facility 07/05/88 2nd-Final	GW contaminated with VOCs including TCE, and metals including chromium	45,000 ft^2 (plume area)	GW pump and treatment using selective media ion exchange to remove chromium followed by carbon adsorption to remove VOCs with discharge into the river or city sewer system; and implementation of institutional controls to restrict GW usage and to control new well drilling	The remedy prevents public exposure to drinking water which exceeds MCLs for chromium 0.050 mg/l, TCE 0.005 mg/l, and 1,1,1-trichloroethane 0.2 mg/l. Additionally, treated GW will meet NPDES requirements, EPA WQC for protection of freshwater aquatic life, or city pretreatment requirements (depending on remedial action determinations for discharge)	$3,800,000 (present worth)
X	Gould, OR Smelter Facility 03/31/88 1st	Soil and sediments contaminated with metals including lead	80,800 yd^3 (battery casings) 3,370 yd^3 (surface soil) 13,650 yd^3 (subsurface soil) 5,500 yd^3 (sediments) 6,000 yd^3 (matte)	Excavation and separation of battery casing fragments and matte with recycling of those components that can be recycled, offsite RCRA landfill disposal for nonrecyclable components, and onsite disposal of nonhazardous, nonrecyclable components; excavation, fixation/stabilization and onsite disposal of contaminated soil, sediments, and matte followed by soil capping, revegetation, and site grading; and GW, SW, and air monitoring	EP Toxicity Standards for lead, cadmium, chromium, and zinc (values not specified) will determine disposal of nonrecyclable waste. Additionally, the NAAQs for lead 1.5 ug/m^3 (arithmetic average concentration of all samples collected during any one calendar quarter period) will be met	$3,491,603 (capital) $17,073,581 (present worth O&M)
X	Martin Marietta, OR Industrial Facility 09/29/88 1st-Final	Soil, GW, and debris contaminated with asbestos, VOCs including TCE, organics including PAHs, and inorganics including arsenic, and cyanide	64,870 yd^3	Consolidation of cathode waste material into existing landfill, followed by capping of the landfill; placement of a soil cover over scrubber/sludge ponds; plugging and abandoning production wells and connecting users to the municipal water supply system; collection and treatment of leachate, perched water, and GW using an onsite aqueous treatment (oxidation and precipitation) with onsite discharge to a recycling pond; GW monitoring; and implementation of institutional controls	Soil cleanup goals include arsenic 65 mg/kg based on carcinogenic risk and PAHs 175 mg/kg based on background. GW cleanup will meet proposed ACLs for fluoride 9.7 mg/l and sulfate 3,020 mg/l	$6,707,400 (present worth) $144,000 (annual O&M years 1-5) $55,600 (annual O&M years 6-30)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
X	Pacific Hide and Fur, ID Industrial Facility 06/28/88 1st-Final	Soil contaminated with PCBs	8,200 yd^3	Excavation of soil followed by screening to separate large contaminated materials and stabilization fixation of a portion of the soil using an immobilization technique; construction of a bottom clay liner, where necessary; and capping of the stabilized material along with any remaining contaminated materials; removal of some GW monitoring wells; GW monitoring; and deed and access restrictions. Onsite consolidation will be implemented if pilot testing finds treatment impracticable	The soil cleanup goal for PCBs 25 mg/kg by weight was established as the EPA cleanup policy for PCB spills and corresponds with a 10^{-4} - 10^{-6} health-based risk level for the entire site (including hot spot areas)	$1,330,000 - $1,890,000 (present worth)
X	Ponders Corner, WA 06/01/84 IRM	GW contaminated with VOCs and organics	Not specified	GW treatment using air stripping; and conduction of RI/FS	Not specified	$1,163,000 (capital) $82,000 (annual O&M)
X	Ponders Corners, WA 09/30/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Continued operation of H1-H2 treatment system; installation of variable-frequency controllers on well pump motors to reduce energy requirements; changing of fan drives on treatment tower; installation of new monitoriong wells, upgrading of existing wells, and continued sampling and analysis of aquifer; excavation and offsite disposal of septic tanks and drain field piping; and placement of administrative restrictions on excavation of soil and installation and usage of wells	The remedy will meet the recommended occupational air levels for VOCs which are based on OSHA Standards	$334,970 (capital) $82,000 (annual O&M)
X	Queen City Farms, WA 10/24/85 1st	SW, soil, and sediments contaminated with VOCs including TCE, organics including PCBs, and metals including chromium and lead	22,000 yd^3	Excavation, stabilization, and offsite disposal of sludges, sediments, and soils; and capping	Not specified	$3,439,000 (capital) O&M (PRP responsibility)
X	South Tacoma Channel Well 12A, WA 03/18/83 IRM	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping	Not specified	$1,200,000 (capital) $60,000 (annual O&M)

FY82-FY88 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
X	South Tacoma Channel Well 12A, WA 05/03/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Continue operation of IRM; construction of a GW treatment system; excavation and offsite disposal of contaminated soil with soil flushing; and maintenance of institutional controls	Specific GW cleanup goals have not been established. Attainment of the 10^{-6} risk range has been recommended	$1,590,000 (capital) $50,000 (annual O&M)
X	Toftdahl Drums, WA 09/30/86 1st-Final	None	Not specified	No further action with GW monitoring	Not specified	$0
X	United Chrome, OR 09/12/86 1st-Final	GW and soil contaminated with metals including chromium	350 tons (offsite disposal)	Excavation and offsite disposal of soils; flushing of soils above shallow GW table; and GW pump and treatment using chemical reduction and precipitation with discharge to POTW or SW	The chromium cleanup criteria for the confined aquifer is 0.05 mg/l and 10 mg/l for the unconfined zone. A treatment effluent concentration of 0.3 to 0.4 mg/l chromium is expected to be maintained	$1,580,000 (capital) $261,000 (annual O&M)
X	Western Processing, WA 08/05/84 1st	GW and soil contaminated with VOCs including TCE, inorganics including cyanide, pesticides, and metals including arsenic and cadmium	Not specified	Removal and offsite disposal/incineration of all bulk liquids, drummed liquids, waste piles, and other debris; removal and proper disposal of all transformers and substation equipment; demolition and offsite disposal of all onsite buildings; dismantling of all onsite bulk storage tanks; controlling and treatment of stormwater; and onsite and perimeter monitoring of air quality	Not specified	$5,000,000 (capital) O&M (not specified)
X	Western Processing, WA 09/25/85 2nd	GW, SW, soil, and creek sediments contaminated with VOCs, organics including PCBs and PAHs, and metals	Not specified	Soil sampling and analysis of onsite and offsite areas; excavation and offsite disposal of selected soils and non-soil materials; excavation or cleaning and plugging all utility and process lines in Area I; GW extraction and treatment; stormwater control; excavation and onsite disposal of selected soils; excavation of utility lines; cleaning utility manholes and vaults; capping; performing bench scale testing of soil solidification technique; and excavation of Mill Creek sediments; and performing supplemental remedial planning studies if GW contamination migrates	All soils contaminated with PCBs over 2 mg/kg and hot spots exceeding 10^{-5} risk level will be excavated. Aquatic organisms will be protected through MCL or ACL goals	$18,100,000 (capital) $2,000,000 (annual O&M)

SECTION V

RECORDS OF DECISION

KEYWORD LIST: FY 1982-1989

The ROD Keyword List presents the RODs approved from FY 1982-1989 by major keyword categories and subcategories. The list is a compilation of those keywords identified for each site in the ROD abstracts found at the beginning of this document. The first two pages of this list provide an index of all keyword categories and subcategories. The following text lists those RODs associated with each keyword.

RECORD OF DECISION KEYWORD LIST INDEX

Listed below are major keyword categories and their subcategories for Superfund Records of Decision (RODs).

Primary Hazardous Substances Detected

- Acids
- Arsenic
- Asbestos
- Benzene
- Carcinogenic Compounds
- Chromium
- Dioxin
- Inorganics (other than metals)
- Lead
- Metals
- Mining Wastes
- Oils
- Organics
- PAHs
- PCBs
- PCE
- Pesticides
- Phenols
- Radioactive Materials
- Solvents
- TCE
- Toluene
- VOCs
- Xylenes

Contaminated Media

- Air
- Debris
- Ground Water
- Sediment
- Sludge
- Soil
- Surface Water

Public Health and Environmental Threats

- Direct Contact
- Public Exposure

Remedy Selection

- ARAR Waiver
- Institutional Controls
- Interim Remedy
- No Action Remedy
- O&M
- ROD Amendment

Water Supply

- Alternate Water Supply
- Drinking Water Contaminants

Site-Specific Characteristics

- Floodplain
- Sole-Source Aquifer
- Wetlands

Standards/Regulations/Permits/Guidance

- Hybrid/Alternate Closure (not under RCRA)
- ARARs (not listed as a keyword after FY 1988)
  - Clean Air Act
  - Clean Water Act
    - Water Quality Criteria
  - RCRA
    - Closure Requirements
    - Clean Closure
    - Landfill Closure
  - Safe Drinking Water Act
    - MCLs
    - MCLGs
  - State Standards/Regulations
  - Toxic Substances Control Act
- Public Health Advisory
- State Guidance
- State Permit

Testing/Pilot Studies

- Leachability Tests
- Treatability Studies

RECORD OF DECISION KEYWORD LIST INDEX
(Continued)

Technology

Aeration
Air Monitoring
Air Stripping
Biodegradation/Land Application
Capping
Carbon Adsorption (GAC)
Decontamination
Dredging
Excavation
Filling
Ground Water Monitoring
Ground Water Treatment
Incineration/Thermal Destruction
Leachate Collection/Treatment
Levees
Offsite Discharge
Offsite Disposal
Offsite Treatment
Onsite Containment
Onsite Discharge
Onsite Disposal (includes residuals)
Onsite Treatment
Plume Management
Publicly Owned Treatment Works (POTW)
Relocation
Slurry Wall
Soil Washing/Flushing
Solidification/Stabilization
Solvent Extraction
Surface Water Collection/Diversion
Surface Water Monitoring
Surface Water Treatment
Temporary Storage
Treatment Technology
Vacuum Extraction
Venting
Volatilization/Soil Aeration
Vitrification

Miscellaneous

Municipally Owned Site

Historically Significant

ACL
Background Levels
Deferred Decision
Initial Remedial Measure (IRM)
Contingent Remedy

SUPERFUND RECORDS OF DECISION: KEYWORD LIST

Listed below are major keyword categories and their subcategories for Superfund Records of Decision (RODs). Following each of these categories is a broad sampling of RODs containing the listed keyword. Some categories may become obsolete or new categories may develop over time due to changes in the focus of the Superfund remedy selection process; these categories have been noted, as appropriate. The Superfund managers in each Region have copies of all RODs.

KEYWORDS (BY CATEGORY) AND ASSOCIATED ROD SITES (BY SITE, STATE (REGION))

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Acids

Charles George, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Nyanza Chemical, MA (I); Western Sand & Gravel, RI (I); Yaworski Lagoon, CT (I); Chemical Control, NJ (II); Claremont Polychemical, NY (II)*; PAS Oswego, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); Southern Maryland Wood, MD (III); A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Forest Waste, MI (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Arkansas City Dump, KS (VII); Conservation Chemical, MO (VII); Fulbright/Sac River Landfill, MO (VII); Celtor Chemical Works, CA (IX); Iron Mountain Mines, CA (IX); Stringfellow Acid Pits, CA (IX)*; Gould, OR (X); Queen City Farms-IRM/EDD WA (X); Western Processing, WA (X)

Arsenic

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Saco Tannery Waste Pits, ME (I)*; W.R. Grace (Acton Plant), MA (I); Chemical Control, NJ (II); Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; D'Imperio Property, NJ (II); Fulton Terminals, NY (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Montgomery Township Housing, NJ (II)*; North Sea Municipal Landfill, NY (II); Ringwood Mines/Landfill, NY (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Chisman Creek, VA (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Hederson Road, PA (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Rhinehart Tire Fire, VA (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; American Creosote, FL (IV); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Newport Dump, KY (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Chem-Dyne-EDD, OH (V);

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*	Subsequent Record of Decision
S	Supplemental Record of Decision
EDD	Enforcement Decision Document

Arsenic (continued)

Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); MIDCO II, IN (V); Morris Arsenic, MN (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Ott/Story/Cordova Chemical, MI (V); South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Kem-Pest Laboratory, MO (VII); Todtz, Lawrence Farm, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Milltown, MT (VIII); Woodbury Chemical, CO (VIII)*; Celtor Chemical, CA (IX)*; Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); McColl, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/NearShore (9/30/89), WA (X); Martin Marietta, OR (X); Western Processing, WA (X)

Asbestos

Asbestos Dump, NJ (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Fike Chemical, WV (III); Publicker/Cuyahoga Wrecking, PA (III); West Virginia Ordnance, WV (III); Cape Fear Wood Preserving, NC (IV); Johns-Manville, IL (V); New Lyme, OH (V); Broderick Wood Products, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Mountain View/Globe, AZ Asbestos(IX); Purity Oil Sales, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Martin Marietta, OR (X)

Benzene

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Port Washington Landfill, NY (II); Vega Alta, PR (II); Volney Landfill, NY (II); York Oil, NY (II); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kane and Lombard, MD (III); L.A. Clarke & Son, VA (III); Southern Maryland Wood, MD (III); Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Perdido Groundwater, AL (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Cliff/Dow

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* Subsequent Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Benzene (continued)

Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Kummer Sanitary Landfill, MN (V)*; Liquid Disposal, MI (V); Mason County Landfill, MI (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Bailey Waste Disposal, TX (VI); Highlands Acid Pits, TX (VI)*; Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Koppers (Oroville Plant), CA (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X)

Carcinogenic Compounds

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I); Charles George, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Glen Ridge Radium, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Montgomery Township, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); SMS Instruments, NY (II); Upjohn Manufacturing, PR (II); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); CryoChem, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Middletown Airfield, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Strasburg Landfill, PA (III); Taylor Borough, PA (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Powersville Landfill,

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* Subsequent Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Carcinogenic Compounds (continued)

GA (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Hedblum Industries, MI (V); Ionia City Landfill, MI (V); Kysor Industrial, MI (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar, MN (V); U.S. Aviex, MI (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Wedzeb Enterprises, IN (V); Windom Dump, MN (V); Bailey Waste Disposal, TX (VI); French Limited, TX (VI); Hardage/Criner, OK (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; United Creosoting, TX (VI)*; Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII)*; Rocky Mountain Arsenal, CO (VIII); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X)

Chromium

Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Saco Tannery Waste Pits, ME (I)*; Yaworski Lagoon, CT (I); Byron Barrel & Drum, NY (II)*; Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Preferred Plating, NY (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Waldick Aerospace, NJ (II); Aladdin Plating, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); New Castle Steel DE (III); Voortman Farm, PA (III); Wildcat Landfill, DE (III)*; Amnicola Dump, TN (IV); Cape Fear Wood Preserving,

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Chromium (continued)

NC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); Independent Nail, SC (IV)*; National Starch, NC (IV); Newport Dump, KY (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Fort Wayne Reduction, IN (V); Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kysor Industrial, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton (TCAAP), MN (V)*; Northernaire, MI (V); Northernaire Plating, MI (V)*; Novaco Industries, MI (V); Republic Steel Quarry, OH (V); Schmalz Dump, WI (V); Schmaltz Dump, WI (V)*; South Andover, MN (V); Summit National, OH (V); Wauconda Sand & Gravel, IL (V);Atchison/Santa Fe (Clovis), NM (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium I, TX (VI)*;Odessa Chromium II, TX (VI); odessa Chromium II, TX (VI)*; South Calvacade Street, TX (VI); Doepke Disposal (Holliday), KS (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Del Norte, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Frontier Hard Chrome (12/30/87), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X)*

Dioxin

Baird & McGuire, MA (I); Diamond Alkali, NJ (II); Hyde Park-EDD, NY (II); Love Canal, NY (II); Love Canal, NY (II)*; Love Canal/93rd Street School, NY (II)*; Havertown PCP, PA (III); American Creosote Works, FL (IV); Galesburg/Koppers, IL (V); Laskin/Poplar Oil, OH (V); Miami County Incinerator, OH (V); Pristine, OH (V); United Creosoting, TX (VI)*; Conservation Chemical, MO (VII); Ellisville MO (VII); Ellisville Site Area, MO (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII)*; Koppers (Oroville Plant), CA (IX); Selma Pressure Treating, CA (IX)

Inorganics

Auburn Road, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III); Rhinehart Tire Fire,

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Inorganics (continued)

VA (III); Voortman Farm, PA (III); Wade, PA (III); Airco, KY (IV); A. L. Taylor, KY (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Distler Brickyard, KY (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Independent Nail, SC (IV)*; Newport Dump, KY (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar, MN (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); South Andover, MN (V); Summit National, OH (V); Wauconda Sand & Gravel, IL (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Cecil Lindsey, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Tar Creek, OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Ellisville, MO (VII); Fulbright/Sac River Landfill, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Syntex Verona, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Iron Mountain Mine, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X)

Lead

Auburn Road Landfill, NH (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Pinette's Salvage Yard, ME (I); Saco Tannery Waste Pits, ME (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; North Sea Municipal Landfill, NY (II); Preferred Plating, NY (II); Ringwood Mines/Landfill, NY (II); SMS Instruments, NY (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Hebelka Auto Salvage Yard, PA (III); MW Manufacturing, PA (III); New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Voortman Farm, PA (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Flowood, MS (IV); Independent Nail, SC (IV)*; Kassouf-Kimberling Battery, FL (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Auto Ion Chemicals, MI (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Johns-Manville, IL (V); Laskin/Poplar Oil, OH (V); Laskin/Poplar, OH (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Lead (continued)

Avenue Dump, IN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Pristine, OH (V); Republic Steel Quarry, OH (V); South Andover, MN (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Atchison/Santa Fe (Clovis), NM (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); South Calvacade Street, TX (VI); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Doepke Disposal (Holliday), KS (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Purity Oil Sales, CA (IX); Stringfellow Acid Pits, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Gould, OR (X)

Metals

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Keefe Environmental, NH (I); Laurel Park, CT (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Florence Landfill, NJ (II); Fulton Terminals, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Marathon Battery, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); North Sea Municipal Landfill, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Preferred Plating, NY (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NJ (II); SMS Instruments, NY (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Harvey-Knott, DE (III); Havertown PCP, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); Kane & Lombard, MD (III); McAdoo-IRM, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); MW Manufacturing, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Voortman Farm, PA (III); Wade, PA (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; A. L. Taylor, KY (IV); American Creosote, FL (IV); Amnicola Dump, TN (IV); Cape Fear Wood Preserving, NC

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (continued)

(IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Distler Brickyard, KY (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Independent Nail, SC (IV)*; Kassouf-Kimberling Battery, FL (IV); Miami Drum Services, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Marion/Bragg Landfill, IN (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bio-Ecology Systems, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Johns-Manville, IL (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Old Inger, LA (VI); Pesses Chemical, TX (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tar Creek, OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Anaconda Smelter/Mill Metals Creek, MT (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Monticello Vicinity Properties, UT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); Jibboom Junkyard, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (continued)

(X); Northside Landfill, WA (X); Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*

Mining Wastes

Tar Creek, OK (VI); United Nuclear, NM (VI); Cherokee County, KS (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Milltown, MT (VIII); Monticello Vicinity Properties, UT (VIII); Smuggler Mountain, CO (VIII); Atlas Asbestos Mine, CA (IX); Celtor Chemical Works, CA (IX); Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX)

Oils

Davis Liquid Waste, RI (I); Groveland Wells, MA (I); McKin, ME (I)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Douglassville Disposal, PA (III)*; Enterprise Avenue, PA (III); Havertown PCP, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Rhinehart Tire Fire, VA (III); Airco, KY (IV); American Creosote Works, TN (IV); Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); A&F Materials-IRM, IL (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Arkansas City Dump, KS (VII)*; Ellisville, MO (VII); Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII)*; Union Pacific, WY (VIII); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)

Organics/VOCs

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Keefe Environmental, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin-IRM, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Ottati and Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Brewster Well Field (9/29/88), NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II); Chemical Control, NJ (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; Clothier Disposal, NY (II); Combe Fill

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Army Creek Landfill, DE (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Craig Farm Drum, PA (III); CryoChem, PA (III); Croydon TCE Spill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal (Amendment), PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Industrial Lane, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); MW Manufacturing, PA (III); New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Publicker/Cuyahoga Wrecking, PA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Wade, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Alpha Chemical, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); A. L. Taylor, KY (IV); American Creosote, FL (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Ciba-Geigy, AL (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); Perdido Groundwater, AL (IV); Pioneer Sand, FL (IV); Powerville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

(V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V); Ionia City Landfill, MI (V); Kysor Industrial, MI (V); Kummer Landfill, MN (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills (Amendment), MN (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton/St. Anthony-IRM, MN (V); New Brighton (TCAPP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Wedzeb Enterprises, IN (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Inger, LA (VI); Petro-Chemical Systems, TX (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Triangle Chemical, TX (VI); United Creosoting, TX (VI)*; Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX);

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*

PAHs (Polynuclear Aromatic Hydrocarbons)

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Iron Horse Park, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Fulton Terminals, NY (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; North Sea Municipal Landfill, NY (II); Renora Inc., NJ (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Taylor Borough, PA (III); Westline Site, PA (III); Airco, KY (IV); A. L. Taylor, KY (IV); American Creosote, FL (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Industrial Excess Landfill, OH (V)*; Lake Sandy Jo, IN (V);Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Summit National, OH (V); Velsicol Chemical, IL (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; French Limited, TX (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Petro-Chemical Systems, TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Broderick Wood Products, CO (VIII); Libby Ground Water, MT

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PAHs (continued)

(VIII); Koppers (Oroville Plant), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Martin Marietta, OR (X); Western Processing, WA (X)*

PCBs (Polychlorinated Biphenyls)

Cannon Engineering, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Clothier Disposal,NY (II); GE Moreau, NY (II); Goose Farm, NJ (II); Hudson River, NY (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Pijak Farm, NJ (II); Renora Inc., NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); York Oil, NY (II); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Fike Chemical, WV (III); Harvey-Knott, DE (III); Kane & Lombard, MD (III); Lehigh Electric, PA (III); Millcreek, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Wildcat Landfill, DE (III); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Alsco Anaconda, OH (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Biphenyls Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Cross Brothers Pail (Pembroke), IL (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Rose Township, MI (V); Schmalz Dump, WI (V); Summit National, OH (V); Wedzeb Enterprises, IN (V); Bio-Ecology Systems, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR, (VI); MOTCO, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Libby Ground Water, MT (VIII)*; Jibboom Junkyard, CA (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Purity Oil Sales, CA (IX); Taputimu Farm, AS (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

PCE (Tetrachloroethylene/Perchloroethylene)

Auburn Road Landfill, NH (I)*; Keefe Environmental, NH (I); Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); Old Springfield Landfill, VT(I); Picillo Farm, RI (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Wells G&H, MA (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Brewster Well Field (9/29/88), NY (II); Byron Barrel & Drum,

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

PCE (continued)

NY (II)*; Caldwell Trucking, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Katonah Municipal Well, NY (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Vega Alta, PR (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Croydon TCE Spill, PA (III); CryoChem, PA (III); Fischer & Porter, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Middletown Airfield, PA (III); MW Manufacturing, PA (III); Tyson's Dump (Amendment), PA (III); Whitmoyer Laboratories, PA (III); A. L. Taylor, KY (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); SCRDI Dixiana, SC (IV); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (6/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Sheridan Disposal Services, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Lorentz Barrel & Drum, CA (IX); Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Colbert Landfill, WA (X); Northside Landfill, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*

Pesticides

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon/Plymouth MA (I); Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Wells G&H, MA (I); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Chemical Insecticide, NJ (II); Diamond Alkali, NJ (II); Krysowaty Farm, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal, NY (II)*; Love Canal/93rd Street School, NY (II)*; Pijak Farm, NJ (II); Renora, Inc., NJ (II); Syncon Resins, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Leetown Pesticide, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Ciba-Geigy, AL (IV); Gallaway Ponds, TN (IV); Miami Drum Services, FL (IV); Powersville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Chem-Dyne-EDD, OH (V); E.H. Schilling Landfill, OH (V);

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Pesticides (continued)

Forest Waste Disposal, MI (V)*; IMC Terre Haute, IN (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Velsicol Chemical, IL (V); Bayou Sorrel, LA (VI); Crystal City Airport, TX (VI); Hardage/Criner, OK (VI); Old Inger, LA (VI); Aidex-IRM, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Del Norte, CA (IX); Purity Oil Sales, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Western Processing, WA (X)

Phenols

Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Norwood PCBs, MA (I); Picillo Farm, RI (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Clothier Disposal, NY (II); Ewan Property, NJ (II)*; Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Ludlow Sand & Gravel, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); York Oil, NY (II); Avtex Fibers, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Westline, PA (III); American Creosote Works, TN (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Cliff/Dow Dump, MI (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Laskin/Poplar Oil, OH (V); MIDCO I, IN (V); Reilly Tar & Chemical, MN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Sikes Disposal Pits, TX (VI); Conservation Chemical, MO (VII); Ellisville, MO (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

Radioactive Materials

Glen Ridge Radium, NJ (II); Montclair/West Orange Radium, NJ (II); Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Moyer Landfill, PA (III); United Nuclear, NM (VI); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium ROBCO, CO (VIII)*; Monticello Vicinity Properties, UT (VIII)

Solvents

Davis Liquid Waste, RI (I); Keefe Environmental, NH (I); McKin, ME (I)*; Pinette's Salvage Yard, ME (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT

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Solvents (continued)

(I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lone Pine Landfill, NJ (II); Montgomery Township Housing, NJ (II)*; Spence Farm, NJ (II); Vestal, NY (II); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Enterprise Avenue, PA (III); Henderson Road, PA (III)*; Lackawanna Refuse Site, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); MW Manufacturing, PA (III); Miami Drum Services, FL (IV); A&F Materials-IRM, IL (V); Berlin & Farro, MI (V); Charlevoix, MI (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); Forest Waste Disposal, MI (V)*; Ionia City Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton-Interim Water Treatment, MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Old Mill, OH (V); Summit National, OH (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); Taputimu Farm, AS (IX); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); Western Processing, WA (X)

TCE (Trichloroethylene)

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental, NH (I); Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; McKin-IRM, ME (I); Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Western Sand & Gravel, RI (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Brewster Well Field (9/29/88), NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Ciba-Geigy, NJ (II)*; Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Fulton Terminals, NY (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Lang Property, NJ (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Waldick Aerospace, NJ (II); Bendix, PA (III); Blosenski Landfill, PA (III); Drake Chemical, PA (III)*; Fischer & Porter, PA (III); Havertown PCP, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Industrial Lane, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tyson's Dump (Amendment), PA (III); Airco, KY (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Distler Brickyard, KY (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); National Starch, NC (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Big D Campground, OH (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (6/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Coshocton Landfill, OH (V); Cross Brothers Pail

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

TCE (continued)

(Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton/St. Anthony-IRM, MN (V); New Brighton-Water Supply System, MN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V)*; Wausau Water Supply, WI (V); Windom Dump, MN (V); Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/SJ-6, NM (VI)*; Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Marshall Landfill, CO (VII); Solid State Circuits, MO (VII); Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ; Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Gabriel/Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)

Toluene

Auburn Road Landfill, NH (I)*; Charles George, MA (I); Industri-plex, MA (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Bridgeport, NJ (II); Caldwell Trucking, NJ (II)*; Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Sinclair Refinery, NY (II); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Taylor

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Toluene (continued)

Borough, PA (III); Tybouts Corner, DE (III); A. L. Taylor, KY (IV); Airco, KY (IV); American Creosote, FL (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Distler Brickyard, KY (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Wamchem, SC (IV); Zellwood, FL (IV); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); FMC Corporation, MN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Kysor Industrial, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Oak Grove Landfill, MN (V); Ott/Story/Cordova Chemical, MI (V); Republic Steel Quarry, OH (V); Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field, MI (V)*; Bailey Waste Disposal, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); Big River Sand, KS (VII); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ; Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

Xylenes

Kellogg-Deering Well Field, CT (I)*; Sullivan's Ledge, MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); SMS Instruments, NY (II); Henderson Road, PA (III)*; Strasburg Landfill, PA (III); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Kysor Industrial, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Kem-Pest Laboratory, MO (VII); Vogel Paint & Wax, IA (VII); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX)

CONTAMINATED MEDIA

Air

Charles George Landfill 3 & 4, MA (I)*; Landfill & Resource Recovery, RI (I); McKin-IRM, ME (I); Sylvester, NH (I); Asbestos Dump, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Old Bethpage, NY (II); Ambler Asbestos Piles, PA (III); Heleva Landfill, PA (III); Lansdowne Radiation, PA (III)*; Saltville Waste Disposal Ponds, VA

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CONTAMINATED MEDIA

Air (continued)

(III); Taylor Borough, PA (III); Wade, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine, IL (V); Verona Well Field-IRM, MI (V); Wauconda Sand & Gravel, IL (V)*; Anaconda Smelter/Mill Creek, MT (VIII); Denver Radium II, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Mountain View/Globe, AZ (IX); Operating Industries (09/30/88), CA (IX)*; San Fernando Valley (Area 1), CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Taputimu Farm, AS (IX); South Tacoma, WA (X)

Debris

Cannon Engineering, MA (I); Iron Horse Park, MA (I); Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Chemical Control, NJ (II)*; Claremont Polychemical, NY (II)*; GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Love Canal, NY (II)*; Marathon Battery (9/30/88), NY (II)*; Montclair/West Orange Radium, NJ (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); MW Manufacturing, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Southern Maryland Wood, MD (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); Amnicola Dump, TN (IV); Cape Fear Wood Preserving, NC (IV); Kassouf-Kimberling Battery, FL (IV); Smith's Farm, KY (IV); Tower Chemical, FL (IV); Bower's Landfill, OH (V); Ionia City Landfill, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Ninth Avenue Dump, IN (V)*; Pristine, OH (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Brio Refining, TX (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); Odessa Chromium I, TX (VI)*; Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); Fulbright/Sac River Landfill, MO (VII); Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Monticello Vicinity Properties, UT (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); MGM Brakes, CA (IX); Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); South Bay Asbestos Area, CA (IX)*; Frontier Hard Chrome (12/30/87), WA (X); Martin Marietta, OR (X)

Ground Water

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/ Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Tinkham

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Ground Water (continued)

Garage, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II); Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora, Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Spence Farm, NJ (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Douglassville Disposal(Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fischer & Porter, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Industrial Lane, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); Kimberton, PA (III)*; Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); New Castle Spill, DE (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump, PA (III)*; Wade, PA (III); Westline, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Coleman Evans, FL (IV); Davie Landfill, FL (IV); Distler Brickyard, KY (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Independent Nail, SC (IV)*; Kassouf-Kimberling Battery, FL (IV); Miami Drum Services, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Varsol Spill Site, FL (IV); Wamchem, SC (IV);

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CONTAMINATED MEDIA

Ground Water (continued)

Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V)*; A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (6/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); Marion/Bragg Landfill, IN (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Old Midland Products, AR (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley-IRM, NM (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); United Creosoting, TX (VI); United Nuclear, NM (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Arsenic Trioxide, ND (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Milltown-S, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Beckman Instruments/Porterville,

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CONTAMINATED MEDIA

Ground Water (continued)

CA (IX); Celtor Chemical Works, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ; Lorentz Barrel & Drum, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*

Sediments (Creek/River/Stream)

Auburn Road, NH (I); Baird & McGuire, MA (I)*; Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Laurel Park, CT (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Haviland Complex, NY (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Pijak Farm, NJ (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Wide Beach, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); Millcreek, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Industrial Excess Landfill, OH (V)*; Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN

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Sediments (continued)

(V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Schmalz Dump, WI (V); Seymour, IN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wedzeb Enterprises, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Sediments (Creek/River/Geneva Industries, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Denver Radium/Card Property, CO (VIII)*; Milltown, MT (VIII); Woodbury Chemical, CO (VIII); Iron Mountain Mine, CA (IX); MGM Brakes, CA (IX); Commencement Bay/Nearshore (9/30/89), WA (X); Gould, OR (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)

Sludge

Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Bridgeport, NJ (II); Claremont Polychemical, NY (II)*; Florence Landfill, NJ (II); GE Moreau, NY (II); North Sea Municipal Landfill, NY (II); Swope Oil, NJ (II); Bruin Lagoon, PA (III); Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; American Creosote, FL (IV); American Creosote Works, TN (IV); Brown Wood Preserving, FL (IV); Celanese/Shelby Fibers, NC (IV)*; Davie Landfill, FL (IV); Pioneer Sand, FL (IV); Zellwood, FL (IV); Alsco Anaconda, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Forest Waste IRM, MI (V); Forest Waste-IRM, MI (V)*; Laskin Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Newlyme, OH (V); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Gurley Pitt-Edd, AK (VI); Highlands Acid Pit, TX (VI); Mid-South Wood, AK (VI); Motco, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pitts, TX (VI); Arkansas City Dump, KS (VII); Des Moines TCE, IA (VII); Ellisville, MO (VII); Broderick Wood Products, CO (VIII); McColl, CA (IX); Purity Oil Sales, CA (IX); Queen City Farms-IRM/EDD, WA (X)

Soil

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Industri-plex, MA (I); Keefe Environmental, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I);

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Soil (continued)

Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Clothier Disposal,NY (II); Combe Fill North Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Florence Landfill, NJ (II); FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; ; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Bendix, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Enterprise Avenue, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Lackawanna Refuse Site, PA (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA, (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Wade, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote, FL (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Kassouf-Kimberling Battery, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); Cross Brothers Pail

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Soil (continued)

(Pembroke), IL (V); Distler Brickyard, KY (V); E.H. Schilling Landfill, OH (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Morris Arsenic, MN (V); New Lyme, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; Summit National, OH (V); United Scrap Lead, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Crystal City, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Triangle Chem., TX (VI); United Creosoting, TX (VI); United Creosoting, TX (VI)*; Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (V111)*; Denver Radium/ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Milltown, MT (VIII); Milltown-S, MT (VIII); Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Jibboom Junkyard, CA (IX); Litchfield Airport, AZ (IX); McColl, CA (IX); MGM Brakes, CA (IX); Mountain View/Globe, AZ (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*;

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Soil (continued)

Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*

Surface Water

Auburn Road, NH (I); Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Insecticide, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Marathon Battery, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bruin Lagoon, PA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Fischer & Porter PA (III); Harvey-Knott, DE (III); Havertown PCP, PA (III); Heleva Landfill, PA (III); Kimberton, PA (III)*; Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD Surface Water (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (VI); National Starch, NC (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Johns-Manville, IL (V); Laskin/Poplar Oil, OH (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI)*; Mid-South Wood, AR (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Tar Creek, OK (VI); Fulbright/Sac River Landfill, MO (VII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Iron Mountain Mine, CA

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CONTAMINATED MEDIA

Surface Water (continued)

(IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*

PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Direct Contact

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Winthrop Landfill-EDD, ME (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Hudson River, NY (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Montclair/West Orange Radium, NJ (II); Montgomery Township, NJ (II); Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Spence Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); MW Manufacturing, PA (III); New Castle Spill, DE (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Publicker/Cuyahoga Wrecking, PA (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); National Starch, NC (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Sodeyco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC

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PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Direct Contact (continued)

(IV); Zellwood, FL (IV); Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V);Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste-IRM, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V); Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton (TCAAP); MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Wedzeb Enterprises, IN (V); Windom Dump, MN (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; Cleve Reber, LA (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII)*; Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); MGM Brakes, CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X)

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PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Public Exposure

Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Laurel Park, CT (I); O'Connor, ME (I); Re-Solve, MA (I)*; Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Glen Ridge Radium, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Upjohn Manufacturing, PR (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Bally Groundwater Contamination, PA (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Henderson Road, PA (III); Lansdowne Radiation, PA (III); Millcreek, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Saltville Waste Disposal Ponds, VA (III); West Virginia Ordnance, WV (III)*; Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; National Starch, NC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Allied/Ironton Coke, OH (V)*; Byron Salvage Yard, IL (V)*; Eau Claire Municipal Well Field, WI (V)*; Galesburg/Koppers, IL (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Outboard Marine (Amendment), IL (V); Rose Township, MI (V); Seymour, IN (V)*; Verona Well Field-IRM, MI (V); Crystal City Airport, TX (VI); Sheridan Disposal Services, TX (VI); South Valley/PL-83, NM (VI)*; Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Times Beach, MO (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII); Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Litchfield Airport, AZ (IX); McColl, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X)

REMEDY SELECTION

ARAR Waiver

Pinette's Salvage Yard, ME (I); Sullivan's Ledge, MA (I); Caldwell Trucking, NJ (II)*; Picatinny Arsenal, NJ (II); Ambler Asbestos Piles, PA (III); Havertown PCP, PA (III); Strasburg Landfill, PA (III); E.H. Schilling Landfill, OH (V); Galesburg/Koppers, IL (V); Libby Ground Water, MT (VIII)*

Institutional Controls

Beacon Heights, CT (I); Cannon Engineering, MA (I); Iron Horse Park, MA (I); Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); Asbestos Dump, NJ (II); Clothier Disposal, NY (II); DeRewal Chemical, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Glen Ridge Radium, NJ (II); Kin-Buc Landfill, NJ (II); Ludlow Sand & Gravel, NY (II); Marathon

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REMEDY SELECTION

Institutional Controls (continued)

Battery, NY (II); Montclair/West Orange Radium, NJ (II); North Sea Municipal Landfill, NY (II); Olean Well Field, NY (II); Pepe Field, NJ (II); Preferred Plating, NY (II); Rocky Hill, NJ (II); Waldick Aerospace, NJ (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Chisman Creek, VA (III); Craig Farm Drum, PA (III); Dorney Road Landfill, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Industrial Lane, PA (III); L.A. Clarke & Son, VA (III); New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Saltville Waste Disposal Ponds, VA (III); Tybouts Corner, DE (III); West Virginia Ordnance Works, WV (III); Westline, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; Airco, KY (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V)*; Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Morris Arsenic, MN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Dixie Oil, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products; AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; South Cavalcade Street, TX (VI); South Valley/SJ-6, NM (VI)*; United Creosoting, TX (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deer, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Fulbright/Sac River Landfill, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Aberdeen Pesticide/Fairway Six, NC (IV); Arsenic Trioxide, ND (VIII); Burlington Northern (Somers), MT (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); Purity Oil Sales, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*

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REMEDY SELECTION

Interim Remedy

Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Diamond Alkali, NJ (II); Glen Ridge Radium, NJ (II); Upjohn Manufacturing, PR (II); Picatinny Arsenal, NJ (II); Vineland Chemical, NJ (II); Bally Groundwater Contamination, PA (III); Croydon TCE Spill, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Kane & Lombard, MD (III); Kimberton, PA (III); Middletown Airfield, PA (III); Palmerton Zinc, PA (III); Saltville Waste Disposal Ponds, VA (III); Strasburg Landfill, PA (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Whitmoyer Laboratories, PA (III); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Wausau Water Supply, WI (V); Cherokee County/Galena, KS (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII)*; Litchfield Airport, AZ (IX); Operating Industries, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); Stringfellow Acid Pits, CA (IX); Gould, OR (X)

No Action Remedy

Beachwood/Berkeley Well, NJ (II); BEC Trucking, NY (II); Cooper Road, NJ (II); Friedman Property, NJ (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Vineland State School, NJ (II); Middletown Road, MD (III); New Castle Steel DE (III); Presque Isle, PA (III); Reeser's Landfill, PA (III); Taylor Borough, PA (III)*; Voortman Farm, PA (III); Westline, PA (III)*; Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); South Brunswick Landfill, NJ (II)*; Spence Farm, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Army Creek Landfill, DE (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PACiba-Geigy, AL (IV); Independent Nail, SC (IV)*; Kassouf-Kimberling Battery, FL (IV); Tri-City Conservation, FL (IV); Varsol Spill, FL (IV); Adrian Municipal Well Field, MN (V); Cemetery Dump, MI (V); IMC Terre Haute, IN (V); Morris Arsenic, MN (V); NL/Taracorp/Golden Auto Parts, MN (V)*; Peterson Sand & Gravel, IL (V); Poer Farm, IN (V); Whitehall Municipal Wells, MI (V); Cecil Lindsey, AR (VI); Gurley Pit, AR (VI); Highlands Acid Pit, TX (VI)*; Homestake Mining, NM (VI); Sand Springs, OK (VI)*; South Valley/Edmunds Street, NM (VI)*; Stewco, TX (VI); Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); John's Sludge Pond, KS (VII); Ordot Landfill, GU (IX); Toftdahl Drum, WA (X)*

O & M

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I);

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REMEDY SELECTION

O & M (continued)

Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Clothier Disposal,NY (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Florence Landfill, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, KY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); CryoChem, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA (III)*; Limestone Road, MD (III); Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner Landfill, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, VA (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH

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O & M (continued)

(V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); United Creosoting, TX (VI); United Creosoting, TX (VI)*; United Nuclear, NM (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Arsenic Trioxide, ND (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Milltown, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Iron Mountain Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX)*; Tucson

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*	Subsequent Record of Decision
S	Supplemental Record of Decision
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REMEDY SELECTION

O & M (continued)

International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Toftdahl Drum, WA (X); United Chrome, OR (X); Western Processing, WA (X)*

ROD Amendment

Sylvester, NH (I); Douglassville Disposal (Amendment), PA (III); Tyson's Dump (Amendment), PA (III); New Brighton/Arden Hills (Amendment), MN (V); Outboard Marine (Amendment), IL (V); Milltown, MT (VIII)

WATER SUPPLY

Alternate Water Supply

Auburn Road, NH (I): Charles George, MA (I); Davis Liquid Waste, RI (I); Kellogg-Deering Well Field, CT (I)*; Winthrop Landfill-EDD, ME (I); American Thermostat, NY (II); Bridgeport, NJ (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); Haviland Complex, NY (II); Kentucky Avenue Well Field, NY (II); Krysowaty Farm, NJ (II); Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Olean Well Field, NY (II); Price Landfill, NJ (II); Rocky Hill, NJ (II); Vega Alta, PR (II); Williams Property, NJ (II); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Croydon TCE Spill, PA (III); CryoChem, PA (III); Fischer & Porter, PA (III); Industrial Lane, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Strasburg Landfill, PA (III); Palmetto Wood Preserving, SC (IV); Powersville Landfill, GA (IV); Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Byron Salvage, IL (V)*; Byron Salvage (6/30/89), IL (V)*; Charlevoix, MI (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; Industrial Excess Landfill, OH (V); Kummer Landfill, MN (V); Lake Sandy Jo, IN (V); Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Water Supply System, MN (V)*; Old Mill, OH (V); Reilly Tar, MN (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Wausau Water Supply, WI (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); South Valley-IRM, NM (VI); Cherokee County/Galena, KS (VII); Deere, John, Dubuque Works, IA (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Landfill, WA (X); Northside Landfill, WA (X)

Drinking Water Contaminants

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH

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* Subsequent Record of Decision
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WATER SUPPLY

Drinking Water Contaminants (continued)

(I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Kentucky Avenue Well Field, NY (II); Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Well Field, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Williams Property, NJ (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Croydon TCE Spill, PA (III); CryoChem, PA (III); Delaware Sand and Gravel, DE (III); Fischer & Porter, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Industrial Lane, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; Middletown Airfield, PA (III); New Castle Steel DE (III); Wildcat Landfill, DE (III); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Geiger (C&M Oil), SC (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Bower's Landfill, OH (V); Byron Johnson Salvage Yard, IL (V)*; Byron Salvage Yard, IL (V)*; Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V); Industrial Excess Landfill, OH (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills/St. Anthony, MN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V); Seymour, IN (V)*; Tower Chemical, FL (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Hardage/Criner, OK (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Vogel Paint & Wax, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4)*, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X)

Floodplain

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*;

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WATER SUPPLY

Floodplain (continued)

Norwood PCBs, MA (I); O'Connor, ME (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Florence Landfill, NJ (II); Fulton Terminals, NY (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Renora Inc., NJ (II); Sharkey Landfill, NJ (II); Vineland Chemical, NJ (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Bendix, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III)*; Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Fike Chemical, WV (III); Havertown PCP, PA (III); L.A. Clarke & Son, VA (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Kassouf-Kimberling Battery, FL (IV); Newport Dump Site, KY (IV); Wamchem, SC (IV); A&F Materials, IL (V); A&F Materials-EDD, IL (V)*; Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Bower's Landfill, OH (V); FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Ionia City Landfill, MI (V); Laskin/Poplar Oil, OH (V); Ott/Story/Cordova Chemical, MI (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Miami County Incinerator, OH (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Cleve Reber, LA (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Gurley Pit (9/26/88), AR (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Motco, TX (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; Sikes Disposal Pits, TX (VI); Triangle Chemical, TX (VI); United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County, KS (VII)*; Deere, John, Dubuque Works, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Burlington Northern (Somers), MT (VIII); Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Celtor Chemical, CA (IX)*; Koppers (Oroville Plant), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (12/30/87), WA (X)

Sole-Source Aquifer

Davis Liquid Waste, RI (I); Caldwell Trucking, NJ (II)*; Price Landfill, NJ (II); Rockaway Borough Wellfield, NJ (II); SMS Instruments, NY (II); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Biscayne Aquifer Sites, FL (IV); Pioneer Sand, FL (IV); Zellwood, FL (IV); Wausau Water Supply, WI (V)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; Cherokee County, KS (VII)*; Hastings Groundwater/Colorado Avenue, NE (VII); Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Northside Landfill, WA (X)

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WATER SUPPLY

Wetlands

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Clothier Disposal, NY (II); Combe Fill South Landfill, NJ (II); Ewan Property, NJ (II)*; Helen Kramer, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); PAS Oswego, NY (II); Renora Inc., NJ (II); Vineland Chemical, NJ (II); Wide Beach, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); L.A. Clarke & Son, VA (III); Millcreek, PA (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; Cape Fear Wood Preserving, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Kummer Sanitary Landfill, MN (V)*; Mason County Landfill, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Oak Grove Landfill, MN (V); Ott/Story/Cordova Chemical, MI (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Waste Disposal Engineering, MN (V); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Homestake Mining, NM (VI); Motco, TX (VI)*; Old Inger, LA (VI); Tar Creek, OK (VI); Cherokee County, KS (VII)*; South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Nearshore (9/30/89), WA (X)

STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Hybrid/Alternate Closure

Davis Liquid Waste, RI (I); Ringwood Mines/Landfill, NY (II); Kane & Lombard, MD (III); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Johns-Mansville, IL (V) Velsicol Chemical, IL (V); Arkansas City Dump, KS (VII); Frontier Hard Chrome (12/30/87), WA (X)

ARARs (Used as a keyword from FY 1982 - 1988 only)

Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II)*; Ewan Property, NJ (II); GE

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

ARARs (continued)

Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Katonah Municipal Well, NY; Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II); Nascolite, NJ (II); Old Bethpage, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III): Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV): Goodrich, B.F., KY (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Tower Chemical, FL (IV); Tri-City Conservation, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton (TCAAP), MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); Petro-Chemical System, TX (VI); Sand Springs, OK (VI)*; Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII);

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ARARs (continued)

Central City/Clear Creek, CO (VIII); Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX);Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfills, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X)

Clean Air Act

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Lipari Landfill, NJ (II)*; Picatinny Arsenal, NJ (II); Reich Farm, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Ambler Asbestos Piles, PA (III); Bally Groundwater Contamination, PA (III); Douglassville Disposal (Amendment), PA (III); Fike Chemical, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Goodrich, B.F., KY (IV); National Starch, NC (IV); Smith's Farm, KY (IV); Big D Campground, OH (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Fort Wayne Reduction, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton (TCAAP), MN (V)*; Northernaire Plating, MI (V)*; Seymour, IN (V)*; U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Wausau Water Supply, WI (V)*; French Limited, TX (VI); Gurley Pit, AR (VI); United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Area I, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Gould, OR (X); Northside Landfill, WA (X)

Clean Water Act

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Davis Liquid Waste, RI (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); ; Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor,

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Clean Water Act (continued)

ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; Endicott Village Well Field, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Lipari Landfill (7/11/88), NJ (II)*; Marathon Battery (9/29/89), NY (II)*; Nascolite, NJ (II); Picatinny Arsenal, NJ (II); Preferred Plating, NY (II); South Brunswick Landfill, NJ (II); Vega Alta, PR (II); Volney Landfill, NY (II); York Oil, NY (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Ciba-Geigy, AL (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Big D Campground, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V); Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Ionia City Landfill, MI (V); Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO II, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Rose Township, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Windom Dump, MN (V); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Litchfield Airport, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Stringfellow Acid Pits, CA (IX); South Bay Asbestos Area, CA (IX)*; Colbert Landfill, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Water Quality Criteria

Re-Solve, MA (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); American Thermostat, NY (II); Chemical Control, NJ (II)*; Endicott Village Well Field, NY (II); Fulton Terminals, NY (II); Katonah Municipal Well, NY (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Marathon Battery (9/29/89), NY (II)*; Preferred Plating, NY (II); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kimberton, PA (III)*; New Castle Steel DE (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III)*; Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Kysor Industrial, MI (V); New Brighton-Water Supply System, MN (V)*; Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; United Creosoting, TX (VI)*; Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Vogel Paint & Wax, IA (VII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX) Bally Groundwater Contamination, PA (III); Ordot Landfill, GU (IX); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

RCRA

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I), Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Western Sand & Gravel, RI (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Claremont Polychemical, NY (II)*; Diamond Alkali, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); GE Wiring Devices, PR (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); PAS Oswego, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); SMS Instruments, NY (II); South Brunswick Landfill, NJ (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II);

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RCRA (continued)

York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; L.A. Clarke & Son, VA (III); MW Manufacturing, PA (III); New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Publicker/Cuyahoga Wrecking, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northernaire Plating, MI (V)*; Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI)*; Aidex, IA (VII)*; Arkansas City Dump,KS (VII); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Hastings Ground Water, NE (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII); Libby Ground Water, MT (VIII)*; Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (S San Jose), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Area I, CA (IX); San Fernando

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RCRA (continued)

Valley (Area 1), CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX) Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*

Closure Requirements

Auburn Road Landfill, NH (I)*; Landfill & Resource Recovery, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Bridgeport, NJ (II); Combe Fill North Landfill, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Picatinny Arsenal, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Vineland Chemical, NJ (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Enterprise Avenue, PA (III); Kane & Lombard, MD (III); Moyer Landfill, PA (III); Ordnance Works Disposal Areas (Amendment), WV (III); Tyson's Dump (Amendment), PA (III); West Virginia Ordnance, WV (III)*; Whitmoyer Laboratories, PA (III); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Gallaway Ponds, TN (IV); Pioneer Sand, FL (IV); Smith's Farm, KY (IV); Auto Ion Chemicals, MI (V); Allied/Ironton Coke, OH (V)*; Cliff/Dow Dump, MI (V); Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Ionia City Landfill, MI (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Motco, TX (VI)*; Rose Township, MI (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Bayou Sorrel, LA (VI); Industrial Waste Control, AR (VI); Pesses Chemical, TX (VI); Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Midwest Manufacturing/North Farm, IA (VII); Libby Ground Water, MT (VIII)*; Sand Creek Industrial, CO (VIII); Selma Pressure Treating, CA (IX); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); South Tacoma, WA (X); Western Processing, WA (X)*

Clean Closure

Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Renora Inc., NJ (II); Williams Property, NJ (II); Havertown PCP, PA (III); Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Alsco Anaconda, OH (V); Ninth Avenue Dump, IN (V)*; Bayou Bonfouca, LA (VI)*; Pesses Chemical, TX (VI); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Sand Creek Industrial, CO (VIII)

Landfill Closure

Landfill & Resource Recovery, RI (I); W.R. Grace (Acton Plant), MA (I); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Port Washington Landfill, NY (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Ordnance Works Disposal (Amendment), WV (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Chemtronics (Amendment), NC (IV); Allied/Ironton Coke, OH (V)*; Bower's Landfill, OH (V); E.H. Schilling Landfill, OH (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Landfill Closure (continued)

(V)*; Johns-Manville, IL (V); Laskin/Poplar Oil, OH (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Hardage/Criner, OK (VI); Doepke Disposal (Holliday), KS (VII); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X)

Safe Drinking Water Act

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Marathon Battery (9/30/88), NY (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); SMS Instruments, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); CryoChem, PA (III); Delaware Sand and Gravel, DE (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kimberton, PA (III); Kimberton, PA (III)*; Middletown Airfield, PA (III); New Castle Steel DE (III); Voortman Farm, PA (III); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Ciba-Geigy, AL (IV); Flowood, MS (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Cliff/Dow Dump, MI (V); Corporation, MN (V)*; Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Long Prairie, MN (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Rose Township, MI (V), Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX

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Safe Drinking Water Act (continued)

(VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County, KS (VII)*; Cherokee County/Galena, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Sand Creek Industrial, CO (VIII); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X)

MCLs

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II); Byron Barrel & Drum, NY (II)*; Ciba-Geigy, NJ (II)*; Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Marathon Battery (9/30/88), NY (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); CryoChem, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Henderson Road, PA (III)*; Kimberton, PA (III); Kimberton, PA (III)*; Middletown Airfield, PA (III); New Castle Steel DE (III); Strasburg Landfill, PA (III); Tyson's Dump, PA (III)*; Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Big D Campground, OH (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Hedblum Industries, MI (V); IMC Terre Haute, IN (V); Industrial Excess

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

MCLs (continued)

Landfill, OH (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); U.S. Aviex, MI (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Brio Refining, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Big River Sand, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

MCLGs

Rose Disposal Pit, MA (I); Bally Groundwater Contamination, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Henderson Road, PA (III)*; Middletown Airfield, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Ciba-Geigy, AL (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); IMC Terre Haute, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); U.S. Aviex, MI (V); Cherokee County, KS (VII)*; Vogel Paint & Wax, IA (VII)

State Standards/Regulations/Guidance

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II); Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II); Asbestos Dump, NJ (II); Bog Creek Farm,

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

State Standards/Regulations/Guidance (continued)

NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Ciba-Geigy, NJ (II)*; Claremont Polychemical, NY (II)*; Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Swope Oil, NJ (II); Suffern Village Well Field, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); New Castle, DE (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Hipps Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Tri-City Conservation, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; AlscoAnaconda, OH (V); Auto Ion Chemicals, MI (V); Auto Ion Chemicals (9/27/89), MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); Ninth Avenue Dump, IN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Schmalz Dump, WI (V)*; Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Dixie Oil, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6,

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State Standards/Regulations/Guidance (continued)

NM (VI)*; United Creosoting, TX (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Kem-Pest Laboratory, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Solid State Circuits,MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Union Pacific, WY (VIII); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Iron Mountain Mine, CA (IX); Koppers (Oroville Plant), CA (IX); (continued)Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; San Fernando Valley (Area 1), CA (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); South Tacoma Channel-Well 12A, WA (X)*

Drinking Water Standards (FY 1982 - 1988 only)

Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Old Springfield Landfill, VT (I); Yaworski Lagoon, CT (I); GE Moreau, NY (II); Marathon Battery (9/30/88), NY (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Upjohn Manufacturing, PR (II); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Coleman Evans, FL (IV); Old Inger, LA (IV); Tri-City Conservation, FL (IV); Allied/Ironton Coke, OH (V)*; Burrows Sanitation, MI (V); IMC Terre Haute, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Milltown, MT (VIII); Indian Bend Wash, AZ (IX); MGM Brakes, CA (IX); Colbert Landfill, WA (X); United Chrome, OR (X)

Toxic Substances Control Act

Cannon Engineering, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); Burnt Fly Bog, NJ (II)*; Clothier Disposal,NY (II); Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Renora Inc., NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Cape Fear Wood Preserving, NC (IV); Chemtronics, NC (IV); Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); Alsco Anaconda, OH (V); Belvidere Landfill, IL (V); Conservation and

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Toxic Substances Control Act (continued)

Chemical Corporation, IN (V); Cross Brothers Pail (Pembroke), IL (V); Fields Brook, OH (V); LaSalle Electrical Utilities, IL (V)*; MIDCO I, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Summit National, OH (V); U.S. Aviex, MI Control Act (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Wedzeb Enterprises, IN (V); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); North Calvacade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Ordot Landfill, GU (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X); Northwest South Bay Asbestos Area, CA (IX)*; Transformer, WA (X); Pacific Hide and Fur, ID (X)

Public Health Advisory

Norwood PCBs, MA (I); Ambler Asbestos Piles, PA (III); Lansdowne Radiation, PA (III); Northernaire Plating, MI (V)*

State Permit

Iron Horse Park, MA (I); Norwood PCBs, MA (I); Bog Creek Farm, NJ (II)*; Chemical Insecticide, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Kin-Buc Landfill, NJ (II); Marathon Battery (9/29/89), NY (II)*; Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Army Creek Landfill, DE (III); Bally Groundwater Contamination, PA (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Kimberton, PA (III)*; Airco, KY (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Byron Salvage Yard, IL (V)*; Cross Brothers Pail (Pembroke), IL (V); Hedblum Industries, MI (V); Kysor Industrial, MI (V); MIDCO I, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Verona Well Field-IRM, MI (V); Wausau Water Supply, WI (V); South Calvacade Street, TX (VI); Solid State Circuits, MO (VII); IBM (San Jose), CA (IX); Koppers (Oroville Plant), CA (IX); Motorola 52nd Street, AZ (IX); Commencement Bay/Nearshore (9/30/89), WA (X)

TESTING/PILOT STUDIES

Leachability Tests

Iron Horse Park, MA (I); Re-Solve, MA (I); DeRewal Chemical, NJ (II); Love Canal/93rd Street School, NY (II)*; North Sea Municipal Landfill, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Vineland Chemical, NJ (II); Ciba-Geigy, AL (IV); Flowood, MS (IV); Auto Ion Chemicals, MI (V); United Scrap Lead, OH (V); Motco, TX (VI)*; United Creosoting, TX (VI)*; Cherokee County, KS (VII)*; Midwest Manufacturing/North Farm, IA (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Koppers (Oroville Plant), CA (IX)

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TESTING/PILOT STUDIES

Treatability Studies

Davis Liquid Waste, RI (I); Landfill & Resource Recovery, RI (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; Ewan Property, NJ (II)*; GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Kin-Buc Landfill, NJ (II); Montclair/West Orange Radium, NJ (II); Montgomery Township Housing, NJ (II)*; Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); SMS Instruments, NY (II); Tabernacle Drum Dump, NJ (II); Vineland Chemical, NJ (II); York Oil, NY (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III) Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA, (III); Southern Maryland Wood, MD (III); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Kassouf-Kimberling Battery, FL (IV); Leetown Pesticide, WV (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Cliff/Dow Dump, MI (V); Galesburg/Koppers, IL (V); Ionia City Landfill, MI (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); Ninth Avenue Dump, IN (V)*; Pristine, OH (V); Seymour, IN (V)*; Bailey Waste Disposal, TX (VI); Koppers/Texarkana, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Sol Lynn (03/25/88), TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (09/23/88), TX (VI)*; Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII); Libby Ground Water, MT (VIII)*; Fairchild Semicond (S San Jose), CA (IX); Koppers (Oroville Plant), CA (IX); Lorentz Barrel & Drum, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Northwest Transformer, WA (X)

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Aeration

Cannon Engineering, MA (I); Groveland Wells, MA (I); McKin, ME (I); Ottati & Goss/Great Lakes, NH (I); Bendix, PA (III); Hollingsworth, FL (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Galesburg/Koppers, IL (V); Mason County Landfill, MI (V); Waite Park Wells, MN (V); South Valley/Edmunds Street, NM (VI)*; Triangle Chem., TX (VI); Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Area I, CA (IX); Tucson International Airport, AZ (IX)

Air Monitoring

Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I)*; Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME

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Air Monitoring (continued)

(I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Clothier Disposal, NY (II); Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Montclair/West Orange Radium, NJ (II); North Sea Municipal Landfill, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Ordnance Works Disposal, WV (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Perdido Groundwater, AL (IV); Cliff/Dow Dump, MI (V); Forest Waste Disposal, MI (V)*; Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Oak Grove Landfill, MN (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Brio Refining, TX (VI); Dixie Oil, TX (VI); Koppers/Texarkana, TX (VI); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Solid State Circuits, MO (VII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Operating Industries, CA (IX), Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Tacoma, WA (X); Gould, OR (X)

Air Stripping

Auburn Road Landfill, NH (I)*; Davis Liquid Waste, RI (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Wells G&H, MA (I); Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Endicott Village Well Field, NY (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Lang Property, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Kimberton, PA (III)*; Tyson's Dump, PA (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Biscayne Aquifer Sites, FL (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Belvidere Landfill, IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Industrial Excess Landfill, OH (V)*; LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); New Brighton (TCAAP), MN (V)*; Northernaire Plating, MI (V)*; Pristine, OH (V); Rose Township, MI (V); Seymour, IN (V); Seymour, IN (V)*; U.S. Aviex, MI (V); Verona Well Field-IRM, MA (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Chemplex, IA (VII); Des Moines TCE, IA (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX);

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Air Stripping (continued)

Litchfield Airport (9/26/89), AZ (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*

Biodegredation/Land Application

Iron Horse Park, MA (I); Tinkham Garage, NH (I); Renora Inc. N.J. (II); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Whitmoyer Laboratories, PA (III); American Creosote Works, FL (IV); Brown Wood Preserving, FL (IV); Byron/Johnson Salvage, IL (V); Cliff/Dow Dump, MI (V); Galesburg/Koppers, IL (V); Atchinson/Santa Fe (Clovis), NM (VI); French Limited, TX (VI); North Cavalcade, TX (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Chemplex, IA (VII); Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Koppers (Oroville Plant), CA (IX)

Capping

Auburn Road Landfill, NH (I)*; Beacon Heights, CT (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Industri-plex, MA (I); Laurel Park, CT (I); Nyanza Chemical, MA (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Port Washington Landfill, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Volney Landfill, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (9/29/89), PA (III); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Davie Landfill, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Newport Dump Site, KY (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*;

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Capping (continued)

Kysor Industrial, MI (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, MI (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Lyme, OH (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Outboard Marine (Amendment), IL (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bio-Ecology Systems Site, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Geneva Industries, TX, (VI); Gurley Pit, AR, (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Conservation Chemical, MO (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Doepke Disposal (Holliday), KS (VII); Libby Ground Water, MT (VIII)*; Smuggler Mountain, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Mountain View/Globe, AZ (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X); Western Processing, WA (X)*

Carbon Absorption (GAC)

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & Beacon Heights, CT (I); Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I)*; McGuire, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Ciba-Geigy, NJ (II)*; Fulton Terminals, NY (II); Kin-Buc Landfill, NJ (II); Montclair/West Orange Radium, NJ (II); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Tabernacle Drum Dump, NJ (II); Bendix, PA (III); CryoChem, PA (III); Kimberton, PA (III); Southern Maryland Wood, MD (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); American Creosote Works, TN (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Big D Campground, OH (V); Wamchem, SC (IV); E.H. Schilling Landfill, OH (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Kysor Industrial, MI (V); Miami County Incinerator, OH (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; Northernaire Plating, MI (V)*; New Lyme, OH (V); Outboard Marine (Amendment), IL (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Velsicol Chemical, IL (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Koppers/Texarkana, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Broderick Wood Products, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel

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Carbon Absorption (GAC) (continued)

(Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Northside Landfill, WA (X)

Decontamination

Cannon Engineering, MA (I); Iron Horse Park, MA (I); Norwood PCBs, MA (I); Byron Barrel & Drum, NY (II)*; Diamond Alkali, NJ (II) Ewan Property, NJ (II); Marathon Battery (9/30/88), NY (II)*; SMS Instruments, NY (II); Vineland Chemical, NJ (II); Publicker/Cuyahoga Wrecking, PA (III); Whitmoyer Laboratories, PA (III); American Creosote Works, TN (IV); Cape Fear Wood Preserving, NC (IV); Laskin/Poplar Oil, OH (V); Ninth Avenue Dump, IN (V)*; Pristine, OH (V); United Scrap Lead, OH (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); Vogel Paint & Wax, IA (VII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX)

Dredging

Hocomonco Pond, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Hudson River, NY (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Marathon Battery, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Vineland Chemical, NJ (II); L.A. Clarke & Son, VA (III); Southern Maryland Wood, MD (III); Cape Fear Wood Preserving, NC (IV); Industrial Excess Landfill, OH (V)*; Ninth Avenue Dump, IN (V)*; Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Atchison/Santa Fe (Clovis), NM (VI); Tar Creek, OK (VI); Commencement Bay/Nearshore (9/30/89), WA (X)

Excavation

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Beacon Heights, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II); Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams

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Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Tybouts Corner, DE (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote, FL (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); Kassouf-Kimberling Battery, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Cross Bros., IL (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Ionia City Landfill, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Dixie Oil, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX(VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); Motco, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); United Creosoting, TX (VI)*; Aidex, IA (VII)*; Cherokee County, KS (VII)*; Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Sapce, CO (VIII)*; Denver

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Excavation (continued)

Radium/ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII)*; Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Smuggler Mountain, CO (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Jibboom Junkyard, CA (IX); Koppers (Oroville Plant), CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*

Filling

Baird & McGuire, MA (I)*; Iron Horse Park, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Marathon Battery (9/30/88), NY (II)*; Montclair/West Orange Radium, NJ (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Vineland Chemical, NJ (II); Aladdin Plating, PA (III); Drake Chemical, PA (III)*; Lehigh Electric, PA (III); Taylor Borough, PA (III); Wade, PA (III); Wildcat Landfill, DE (III)*; Airco, KY (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); A&F Materials-EDD, IL (V)*; Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Coshocton Landfill, OH (V); Laskin/Poplar Oil, OH (V); Miami County Incinerator, OH (V); Ninth Avenue Dump, IN (V)*; Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Cleve Reber, LA (VI); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI); Tar Creek, OK (VI); United Creosoting, TX (VI)*; Midwest Manufacturing/North Farm, IA (VII); Syntex Verona, MO (VII); Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII), Woodbury Chemical, CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); MGM Brakes, CA (IX); Raytheon, CA (IX); Martin Marietta, OR (X); Northwest Transformer, WA (X)

Ground Water Monitoring

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); BEC Trucking, NY (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II);

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Ground Water Monitoring (continued)

Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Well Field, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NY (II); Montgomery Township Housing, NJ (II)*; North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); Vineland State School, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Clothier Disposal,NY (II); Croydon TCE Spill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Reeser's Landfill, PA (III); Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Voortman Farm, PA (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage, IL (V)*; Byron Salvage (6/30/89), IL (V)*; Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V);

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Ground Water Monitoring (continued)

Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services, TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Arsenic Trioxide, ND (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Sand Creek Industrial, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Toftdahl Drum, WA (X)

Ground Water Treatment

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; McKin, ME (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Sylvester-S, NH (I); Tinkham Garage, NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Ciba-Geigy, NJ (II)*; Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II);

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Ground Water Treatment (continued)

Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Vineland Chemical, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Kimberton, PA (III); Leetown Pesticide, WV (III); Middletown Airfield, PA (III); Millcreek, PA (III); Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner, DE (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Chem-Dyne-EDD, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Miami County Incinerator, OH (V); MIDCO II, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V)*; Novaco Industries, MI (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Rose Township, MI (V); Seymour, IN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Findett, MO (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Union Pacific, WY (VIII); Beckman Instruments/Porterville, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA

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Ground Water Treatment (continued)

(IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley(Area 1), CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*

Incineration/Thermal Destruction

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Landfill & Resource Recovery, RI (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Fulton Terminals, NY (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal, NY (II)*; Reich Farm, NJ (II); Swope Oil, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Westline, PA (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Smith's Farm, KY (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Fields Brook, OH (V); Fort Wayne Reduction, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Metamora Landfill, MI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Outboard Marine (Amendment), IL (V); Rose Township, MI (V); Spiegelberg Landfill, MI (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Wedzeb Enterprises, IN (V); Bayou Bonfouca, LA (VI)*; Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); MOTCO, TX (VI); Motco, TX (VI)*; Sikes Disposal Pits, TX (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI)*; Hastings Ground Water, NE (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Western Processing, WA (X)

Leachate Collection/Treatment

Beacon Heights, CT (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Picillo Farm, RI (I); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Pepe Field,

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Leachate Collection/Treatment (continued)

NJ (II); Price Landfill, NJ (II)*; Volney Landfill, NY (II); Henderson Road, PA (III)*; Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Tyson's Dump (Amendment), PA (III); Airco, KY (IV); American Creosote Works, FL (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); Pioneer Sand, FL (IV); Smith's Farm, KY (IV); Allied/Ironton Coke, OH (V)*; Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Mid-State Disposal, WI (V); New Lyme, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel, IL (V)*; Hardage/Criner, OK (VI); Petro-Chemical Systems, TX (VI); Vogel Paint & Wax, IA (VII); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Ordot Landfill, GU (IX); Martin Marietta, OR (X); United Chrome, OR (X)

Levees

Baird & McGuire, MA (I); Douglassville, PA (III); American Creosote Works, TN (IV); Old Inger, LA (VI) Sheridan Disposal Services, TX (VI); Times Beach, MO (VII)*; South Bay Asbestos, CA (IX)

Offsite Discharge

Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I)*; Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II)*; GE Moreau, NY (II); GE Wiring Devices, PR (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Reich Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); York Oil, NY (II); Drake Chemical, PA (III)*; Henderson Road, PA (III); Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Ciba-Geigy, AL (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Wamchem, SC (IV);Belvidere Landfill, IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Industrial Excess Landfill, OH (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Long Prairie, MN (V); Miami County Incinerator, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wedzeb Enterprises, IN (V); French Limited, TX (VI); Industrial Waste Control, AR (VI); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Findett, MO (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Central City/Clear Creek, CO (VIII); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (9/26/89), AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX) Tucson International Airport, AZ (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

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Offsite Disposal

Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); McKin, ME (I)*; O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); South Municipal Water Supply, NH (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Control, NJ (II); Claremont Polychemical, NY (II)*; D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Glen Ridge Radium, NJ (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); SMS Instruments, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Havertown PCP, PA (III);Harvey-Knott, DE (III); Hebelka Auto Salvage Yard, PA (III); Lackawanna Refuse Site, PA (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; MW Manufacturing, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Strasburg Landfill, PA (III); Taylor Borough, PA, (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); American Creosote Works, TN (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Distler Brickyard, KY (IV); Miami Drum Services, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Berlin & Farro, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Forest Waste, MI (V)*; Hedblum Industries, MI (V); Johns-Manville, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; MIDCO I, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Wauconda Sand & Gravel, IL (V); Wedzeb Enterprises, IN (V); Bayou Bonfouca, LA (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Dixie Oil, TX (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI)*; Aidex-IRM, IA (VII); Aidex, IA (VII)*; Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Broderick Wood Products, CO (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO

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Offsite Disposal (continued)

(VIII)*; Denver Radium/ROBCO, CO (VIII)*; Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits-IRM, CA (IX); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (9/30/89), WA (X); Gould, OR (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*

Offsite Treatment

Cannon Engineering, MA (I); Laurel Park, CT (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); W.R. Grace (Acton Plant), MA (I); Brewster Well Field, NY (II); Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); GE Moreau, NY (II); Kin-Buc Landfill, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); MW Manufacturing, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Rhinehart Tire Fire, VA (III); Strasburg Landfill, PA (III); Tyson's Dump, PA (III)*; Whitmoyer Laboratories, PA (III); American Creosote Works, TN (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Laskin/Poplar Oil, OH (V)*; Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); Outboard Marine (Amendment), IL (V); Wedzeb Enterprises, IN (V); Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI)*; Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Vogel Paint & Wax, IA (VII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Commencement Bay/Tacoma, WA (X)

Onsite Containment

Auburn Road Landfill, NH (I)*; Iron Horse Park, MA (I); Landfill & Resource Recovery, MA (I); Re-Solve, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Asbestos Dump, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; GE Moreau, NY (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Ludlow Sand & Gravel, NY (II); Pepe Field, NJ (II); Upjohn Manufacturing, PR (II); Ambler Asbestos Piles, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Davie Landfill, FL (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Tower Chemical, FL (IV); Allied/Ironton Coke, OH (V)*; E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); New Lyme, OH (V); Ninth Avenue Dump, IN (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Summit National, OH (V); Velsicol Chemical, IL (V); Windom Dump, MN (V); Bayou Sorrel, LA

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Onsite Containment (continued)

(VI); Bio-Ecology Systems, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; South Cavalcade Street, TX (VI); South Valley/Edmonds Street, NM (VI)*; United Creosoting, TX (VI); Arkansas City Dump, KS (VII); Cherokee County, KS (VII)*; Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Times Beach, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Koppers (Oroville Plant), CA (IX); South Bay Asbestos, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore (9/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Western Processing, WA (X)*

Onsite Discharge

Auburn Road Landfill, NH (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Wells G&H, MA (I); Bog Creek Farm, NJ (II)*; Ciba-Geigy, NJ (II)*; Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; Havertown PCP, PA (III); Haviland Complex, NY (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Vineland Chemical, NJ (II); Williams Property, NJ (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Delaware Sand and Gravel, DE (III); Havertown PCP, PA (III); Henderson Road, PA (III); Kimberton, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III)*; Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Newsome Brothers/Old Reichhold, MS (IV); Perdido Groundwater, AL (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Zellwood, FL (IV); Big D Campground, OH (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Ott/Story/Cordova Chemical, MI (V); Wausau Water Supply, WI (V); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; United Creosoting, TX (VI)*; Fulbright/Sac River Landfill, MO (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Lorentz Barrel & Drum, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); Martin Marietta, OR (X)

Onsite Land Disposal

Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Laurel Park, CT (I); Norwood PCBs, MA (I); Picillo Farm, RI (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II);

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Onsite Land Disposal (continued)

Marathon Battery (9/30/88), NY (II)*; Old Bethpage, NY (II); Vineland Chemical, NJ (II); Ambler Asbestos Piles, PA (III); Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Henderson Road, PA (III)*; Ordnance Works Disposal Areas (Amendment), WV (III); Southern Maryland Wood, MD (III); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote, FL (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Arcanum Iron & Metal, OH (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Cliff/Dow Dump, MI (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Outboard Marine (Amendment), IL (V); Schmalz Dump, WI (V)*; Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Crystal City Airport, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); United Creosoting, TX (VI)*; Aidex, IA (VII)*; Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); Denver Radium III, CO (VIII)*; Libby Ground Water, MT (VIII)*; Smuggler Mountain, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Mountain View/Globe, AZ (IX); Raytheon, CA (IX); Commencement Bay/Nearshore (9/30/89), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Western Processing, WA (X)*

Onsite Treatment

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand

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Onsite Treatment (continued)

Pit, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Hebelka Auto Salvage Yard, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (iii); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Kassouf-Kimberling Battery, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Big D Campground, OH (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Pesses Chemical, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Hastings Ground Water, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Libby Ground Water, MT (VIII)*; Sand Creek Industrial, CO (VIII); Beckman Instruments/Porterville, CA(IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San

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Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X) Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X)

Plume Management

Auburn Road Landfill, NH (I)*; Groveland Wells, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Yaworski Lagoon, CT (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Ciba-Geigy, NJ (II)*; GE Moreau, NY (II); Haviland Company, NY (II); Hyde Park-EDD, NY (II); Old Bethpage, NY (II); Picatinny Arsenal, NJ (II); SMS Instruments, NY (II); Vineland Chemical, NJ (II); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Havertown PCP, PA (III); Henderson Road, PA (III)*; Price Landfill, NJ (III); Cape Fear Wood Preserving, NC (IV); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Cross Brothers Pail (Pembroke), IL (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; MIDCO II, IN (V); Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Seymour, IN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Waite Park Wells, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Cleve Reber, LA (VI); Motco, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; United Nuclear, NM (VI); Chemplex, IA (VII); Findett, MO (VII); Solid State Circuits, MO (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Purity Oil Sales, CA (IX); San Fernando Area I, CA (IX); San Fernando Valley (Area 1), CA (IX); Commencement Bay/Tacoma, WA (X)

Publicly Owned Treatment Works (POTW)

Laurel Park, CT (I); Old Springfield Landfill, VT (I)Tinkham Garage, NH (I); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Lipari Landfill (7/11/88), NJ (II)*; Vega Alta, PR (II); Drake Chemical, PA (III)*; Rhinehart Tire Fire, VA (III); Tybouts Corner, DE (III); Cape Fear Wood Preserving, NC (IV); National Starch, NC (IV); FMC Corporation, MN (V); Galesburg/Koppers, IL (V); Miami County Incinerator, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Outboard Marine (Amendment), IL (V); Seymour, IN (V); Wedzeb Enterprises, IN (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Pesses Chemical, TX (VI); Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Solid State Circuits, MO (VII); Sol Lynn (03/25/88), TX (VI); Vogel Paint & Wax, IA (VII); Del Norte, CA (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Gabriel Area I, CA (IX); Stringfellow Acid Pits, CA (IX)*; Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)*

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TECHNOLOGY

Relocation

DeRewal Chemical, NJ (II); Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Waste Disposal Engineering, MN (V); Koppers/Texarkana, TX (VI); Petro-Chemical Systems, TX (VI); United Creosoting, TX (VI); Times Beach, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Mountain View/Globe, AZ (IX)

Solvent Extraction

Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Ewan Property, NJ (II)*; Outboard Marine (Amendment), IL (V); United Creosoting, TX (VI)*

Slurry Wall

Sylvester, NH (I); Diamond Alkali, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Volney Landfill, NY (II); Kane & Lombard, MD (III); Southern Maryland Wood, MD (III); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Liquid Disposal, MI (V); Ninth Avenue Dump, IN (V); Outboard Marine (Amendment), IL (V); Schmalz Dump, WI (V)*; Summit National, OH (V); Waste Disposal Engineering, MN (V); Bayou Sorrel, LA (VI); Geneva Industries, TX (VI); Industrial Waste Control, AR (VI); Union Pacific, WY (VIII)

Soil Washing/Flushing

Re-Solve, MA (I)*; Byron Barrel & Drum, NY (II)*; Ewan Property, NJ (II)*; Vineland Chemical, NJ (II); L.A. Clarke & Son, VA (III); Cape Fear Wood Preserving, NC (IV); Cross Brothers Pail (Pembroke), IL (V); Ninth Avenue Dump, IN (V)*; United Scrap Lead, OH (V); U.S. Aviex, MI (V); Koppers (Oroville Plant), CA (IX); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI)

Solidification/Stabilization

Charles George Landfill 3 & 4, MA (I)*; O'Connor, ME (I); Re-Solve, MA (I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Chemical Control, NJ (II)*; DeRewal Chemical, NJ (II); Love Canal/93rd Street School, NY (II)*; Marathon Battery (9/30/88), NY (II)*; York Oil, NY (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Aladdin Plating, PA (III); Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Fike Chemical, WV (III); Hebelka Auto Salvage Yard, PA (III); Ordnance Works Disposal Areas (Amendment), WV (III); Publicker/Cuyahoga Wrecking, PA (III); Amnicola Dump, TN (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Pepper's Steel, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Tower Chemical, FL (IV); Alsco Anaconda, OH (V); Burrows Sanitation, MI (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Liquid Disposal, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Velsicol Chemical, IL (V); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Pesses Chemical, TX (VI); Arkansas City Dump, KS (VII); Midwest Manufacturing/North Farm, IA (VII); Denver

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Solidification/Stabilization (continued)

Radium/ROBCO, CO (VIII); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Pacific Hide andFur, ID (X); Queen City Farms-IRM/EDD, WA (X); Queen City Farms, WA (X)

Surface Water Diversion/Collection

Charles George, MA (I)*; McKin, ME (I)*; Nyanza Chemical, MA (I); Sullivan's Ledge, MA (I); Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Blosenski Landfill, PA (III); Chisman Creek, VA (III)*; Dorney Road Landfill, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Kimberton, PA (III)*; Leetown Pesticide, WV (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III); Tower Chemical, FL (IV); Industrial Excess Landfill, OH (V)*; Mid-State Disposal, WI (V); United Scrap Lead, OH (V); Industrial Waste Control, AR (VI); Sheridan Disposal Services, TX (VI); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Cherokee County, KS (VII)*; Stringfellow Acid Pits, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Queen City Farms-IRM/EDD, WA (X)

Surface Water Monitoring

Baird & McGuire, MA (I)*; Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Saco Tannery Waste Pits, ME (I)*; Sullivan's Ledge, MA (I); BEC Trucking, NY (II); Chemical Insecticide, NJ (II); Clothier Disposal,NY (II); Ludlow Sand & Gravel, NY (II); North Sea Municipal Landfill, NY (II); Vineland Chemical, NJ (II); Ambler Asbestos Piles, PA (III); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); FAA Technical Center, NJ (II); Havertown PCP, PA (III); Kimberton, PA (III)*; New Castle Steel DE (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; Alpha Chemical, FL (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); National Starch, NC (IV); Big D Campground, OH (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Miami County Incinerator, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Ott/Story/Cordova Chemical, MI (V); Peterson Sand & Gravel, IL (V); United Scrap Lead, OH (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Highlands Acid Pit, TX (VI)*; Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; Fulbright/Sac River Landfill, MO (VII); Solid State Circuits, MO (VII); Gould, OR (X)

Surface Water Treatment

Havertown PCP, PA (III); Cape Fear Wood Preserving, NC (IV); Industrial Excess Landfill, OH (V)*; Outboard Marine (Amendment), IL (V)

Temporary Storage

Ciba-Geigy, NJ (II)*; Ewan Property, NJ (II); Picatinny Arsenal, NJ (II); Fike Chemical, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Strasburg Landfill, PA (III); Airco, KY (IV); Brown Wood Preserving, FL (IV); Goodrich, B.F., KY (IV); Petro-Chemical Systems, TX (VI); United Creosoting,

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Temporary Storage (continued)

TX (VI)*; Minker/Stout/Romaine Creek, MO (VII); Minker Stout/Stout, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium 12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space Property, CO (VIII)*; Denver Radium ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII)*

Treatment Technology

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Norwood PCBs, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Sullivan's Ledge, MA (I); Tinkham Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Brewster Well Field, NY (II); Brewster Well Field, NY (II); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (7/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Marathon Battery, NY (II); Marathon Battery (9/30/88), NY (II)*; Marathon Battery (9/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Pepe Field, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); SMS Instruments, NY (II); Syncon Resins, NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III)*; Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); MW Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, WV (III); Whitmoyer Laboratories, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Celanese Fibers Operations, NC (IV); Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Kassouf-Kimberling Battery, FL (IV); Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arrowhead Refinery, MN (V); Bayou Bonfouca, LA (VI); Big D Campground, OH (V); Burrows Sanitation, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Ionia City Landfill, MI (V); Kysor Industrial, MI (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Miami County

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Treatment Technology (continued)

Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Wausau Water Supply, WI (V)*; Wedzeb Enterprises, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Oil Mid-South Wood, AR (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Sikes Disposal Pits, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Hastings Ground Water, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (09/30/88), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Triangle Chemical, TX (VI); United Chrome, OR (X); Western Processing, WA (X)*

Vacuum Extraction

Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; South Municipal Water Supply, NH (I); FAA Technical Center, NJ (II); Pepe Field, NJ (II); Port Washington Landfill, NY (II); SMS Instruments, NY (II); Bendix, PA (III); Tyson's Dump (Amendment), PA (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Kysor Industrial, MI (V); Miami County Incinerator, OH (V); Seymour, IN (V); Verona Well Field, MI (V)*; Wausau Water Supply, WI (V)*; South Valley/PL-83, NM (VI)*; Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Sand Creek Industrial, CO (VIII); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX)

Venting

Beacon Heights, CT (I); Charles George, MA (I)*; GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Port Washington Landfill, NY (II); Heleva Landfill, PA (III); Moyer Landfill, PA (III); Allied/Ironton Coke, OH (V)*; IMC Terre Haute, IN (V); Long Prairie, MN (V); Mason County Landfill, MI (V); New Lyme, OH (V); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Hardage/Criner, OK (VI), Operating Industries (09/30/88), CA (IX)*; Martin Marietta, OR (X)

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Volatilization/Soil Aeration

Wells G&H, MA (I); Miami County Incinerator, OH (V); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Intel (Mountain View), CA (IX); Raytheon, CA (IX)

Vitrification

Ionia City Landfill, MI (V); Northwest Transformer, WA (X)

MISCELLANEOUS

Municipally-Owned Site

Kellogg-Deering Well Field, CT (I)*; Winthrop Landfill-EDD, ME (I); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Port Washington Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Volney Landfill, NY (II); Army Creek Landfill, DE (III); Enterprise Avenue, PA (III); Newport Dump Site, KY (IV); Powersville Landfill, GA (IV); Ionia City Landfill, MI (V); New Brighton/Arden Hills (Amendment), MN (V); Wausau Water Supply, WI (V)*; Crystal City Airport, TX (VI); Fulbright/Sac River Landfill, MO (VII); John's Sludge Pond, KS (VII); Denver Radium Site Streets, CO (VIII), Ordot Landfill, GU (IX)

Woodlands (FY 1982 - 1988 only)

Old Springfield Landfill, VT (I); Tinkham Garage, NH (I); Reich Farm, NJ (II); Lansdowne Radiation, PA (III); Palmerton Zinc, PA (III); Forest Waste Disposal, MI (V)*; Mason County Landfill, MI (V); United Scrap Lead, OH (V); Old Inger, LA (VI)

HISTORICALLY SIGNIFICANT

ACL

Saco Tannery Waste Pits, ME (I)*; Sylvester, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Marathon Battery (9/30/88), NY (II)*; Vineland Chemical, NJ (II); Blosenski Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Henderson Road, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); SCRDI Dixiana, SC (IV); Byron Salvage Yard, IL (V)*; E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Velsicol Chemical, IL (V); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Old Mill, OH (V); Martin Marietta, OR (X); Western Processing, WA (X)*

Background Levels

Nyanza Chemical, MA (I); Glen Ridge Radium, NJ (II); Montclair/West Orange Radium, NJ (II); Industrial Lane, PA (III); Kimberton, PA (III)*; Palmerton Zinc, PA (III)*; Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Reilly Tar, MN (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Triangle Chemical, TX (VI); United Nuclear, NM (VI); Aidex, IA (VII)*;

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HISTORICALLY SIGNIFICANT

Background Levels (continued)

Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Koppers (Oroville Plant), CA (IX); Toftdahl Drum, WA (X)

Deferred Decision

Cannon/Plymouth, MA (I); Glen Ridge Radium, NJ (II); Lipari Landfill (9/30/85), NJ (II)*; Montclair/West Orange Radium, NJ (II); Swope Oil, NJ (II); Douglassville, PA (III); McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Tyson's Dump, PA (III); American Cresote, FL (IV); Davie Landfill, FL (IV); New Brighton/Arden Hills/St. Anthony, MN (V)*; Bayou Bonfouca, LA (VI); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*

Initial Remedial Measure (IRM)

New Brighton/Arden Hills (Amendment), MN (V)

Temporary Remedial Measure (FY 1982 - 1988 only)

Hudson River, NY (II); Byron Salvage Yard, IL (VI)*; Denver Radium/ROBCO, CO (VIII); Denver Radium/Card Property, CO (VIII)*; Union Pacific, WY (VIII)

Contingent Remedy

Saco Tannery Waste Pits, ME (I)*; Byron Barrel & Drum, NY (II)*; Preferred Plating, NY (II); SMS Instruments, NY (II); Windom Dump, MN (V); Koppers (Oroville Plant), CA (IX)

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